Chapter 3: Alternatives

3.1 Preliminary Alternatives Analysis and Screening

The development of alternatives for the US 31 Improvement Project began with a broad examination of potential solutions to the transportation needs of the region. The current transportation system, existing and projected traffic conditions, safety, and the overall mobility needs of the State and metropolitan area were evaluated in determining the purpose and need for the project. The State's designation of US 31 as a Statewide Mobility Corridor assists in defining the role and priority of the corridor within the region and State.

A wide range of potential solutions for addressing the project's needs was then developed. Potential alternatives considered included: a No-Action alternative, Travel Demand Management (TDM) alternatives, Transportation System Management (TSM) alternatives, mass transit alternatives, one expressway alternative (widening US 31 to three lanes in each direction with partial access control), and nine freeway alternatives. The nine freeway alternatives range from improving US 31 and SR 431 to urban freeway standards on existing alignment to providing a new freeway facility on a completely new alignment.

This section describes the alternatives considered, the screening process, and the rationale for selecting the alternatives to be evaluated in the DEIS.

3.1.1 Methodology for Screening Alternatives

The alternatives developed for the US 31 Improvement Project were evaluated using a two-phase screening process to determine if they should be carried forward for evaluation in the DEIS. This process is described below.

Phase 1: Purpose and Need

The first phase of the preliminary screening process analyzed the alternatives with respect to the project's overall purpose and need. To satisfy the purpose and need for this project, an alternative would have to improve levels of service to a minimally acceptable level (LOS D) and improve safety. Additionally, the alternative would have to be consistent with State and regional plans including satisfying the criteria for 'Statewide Mobility Corridor' designation, and be consistent with US 31 projects currently programmed in the State's Transportation Improvement Plan (TIP). Alternatives were not eliminated solely on their ability to satisfy 'Statewide Mobility Corridor' requirements. Additionally, although programmed as 'on-alignment' alternatives in the TIP, the alternatives were not eliminated if they were 'off-alignment' as long as the US 31 facility improvements were achieved. If it was determined that an alternative would not satisfy the project's purpose and need, the alternative was not advanced to the next phase of the screening process. Alternatives that would meet the project's purpose and need were advanced to the next phase.

In terms of improving levels of service, the analysis of alternatives focused on the five intersections projected to have the worst service levels north of I-465; 106th, 116th, 126th Streets, Greyhound Pass and State Road (SR) 32. Future Average Daily Traffic (ADT) volumes used to

conduct this analysis were generated using output from the Indianapolis MPO travel demand forecast model.

Safety on roadway segments can typically be improved by upgrading a facility's classification (e.g., from a traffic-signal controlled facility to a freeway). The majority of accidents on US 31 occur during the work-week and during the peak hours when traffic demand is at its highest. Most of the accidents in the corridor are classified as rear-end crashes and also occur during the peak demand time periods. Additionally, it is expected that an upgrade in US 31 facility type would reduce crash risk. The statewide average crash rate for "Urban Other Freeways and Expressways" is 180 crashes per hundred million vehicle miles (HMVM) traveled compared to an "Urban Interstate" which has a crash rate of 53 crashes per HMVM traveled. Sections of US 31 (Urban Other Freeways and Expressways) currently have crash rates ranging from 90 to 460 per HMVM traveled. Therefore, it is anticipated that an upgrade of US 31 to a facility consistent with the "Urban Interstate" classification would reduce crash rates to a level comparable to 53 crashes per HMVM.

Table 3.1-1 shows how each preliminary alternative satisfies the project's purpose and need requirements and identifies which alternatives were advanced to Phase 2 of the screening process.

Phase 2: Environmental Impacts

The second phase of the screening process analyzed the environmental impacts of the alternatives that were advanced from Phase 1. An environmental database was created using readily available data for the US 31 corridor. Geographic Information System (GIS) technology was used to display information, identify potential impacts, and facilitate the screening process. The relative order of magnitude of impacts associated with the alternatives advanced to this phase were assessed using this GIS tool. The following information was assessed:

- Land Use
- Buildings (Residential, Retail, Office, Institutional, etc.)
- Cemeteries
- Public Parks/Section 4(f)
- Emergency Facilities
- Hazardous Materials
- Utilities
- Wetlands
- Water Resources
- Floodplains
- Vegetation and Wildlife Habitat
- Threatened and Endangered Species
- Soils
- Historical & Archaeological/Section 106 Resources

Table 3.1-2 and Figures 3.1-1 through 3.1-4 show the comparison of environmental impacts for each of the preliminary alternatives that were advanced to the Phase 2 analysis and identify the alternatives that were selected to be carried forward for detailed study in the DEIS.

The following sections present the process of evaluating each alternative for Phase 1 and Phase 2 analysis.

Table 3.1-1
Phase 1: Purpose and Need Evaluation

Alternative	Phase 1 – Purpose and Need Criteria			Advanced to Phase 2
	Reduces Congestion on Existing US 31 (LOS D or better)	Improves Safety	Characteristics Consistent with Criteria for INDOT's Statewide Mobility Corridors *	
No-Action	No	No	No	No
TDM	No	No	No	No
TSM	No	No	No	No
Mass Transit	No	No	No	No
Freeway				
Alternative A	No	Yes	Yes	No
Alternative B	No	Yes	Yes	No
Alternative C	No	Yes	Yes	No
Alternative D	No	Yes	Yes	No
Alternative E	Yes	Yes	Yes	Yes
Alternative F	Yes	Yes	Yes	Yes
Alternative G	Yes	Yes	Yes	Yes
Alternative H	Yes	Yes	Yes	Yes
Alternative I	No	Yes	Yes	No
Expressway				
Widen Existing US 31	No	No	No	No

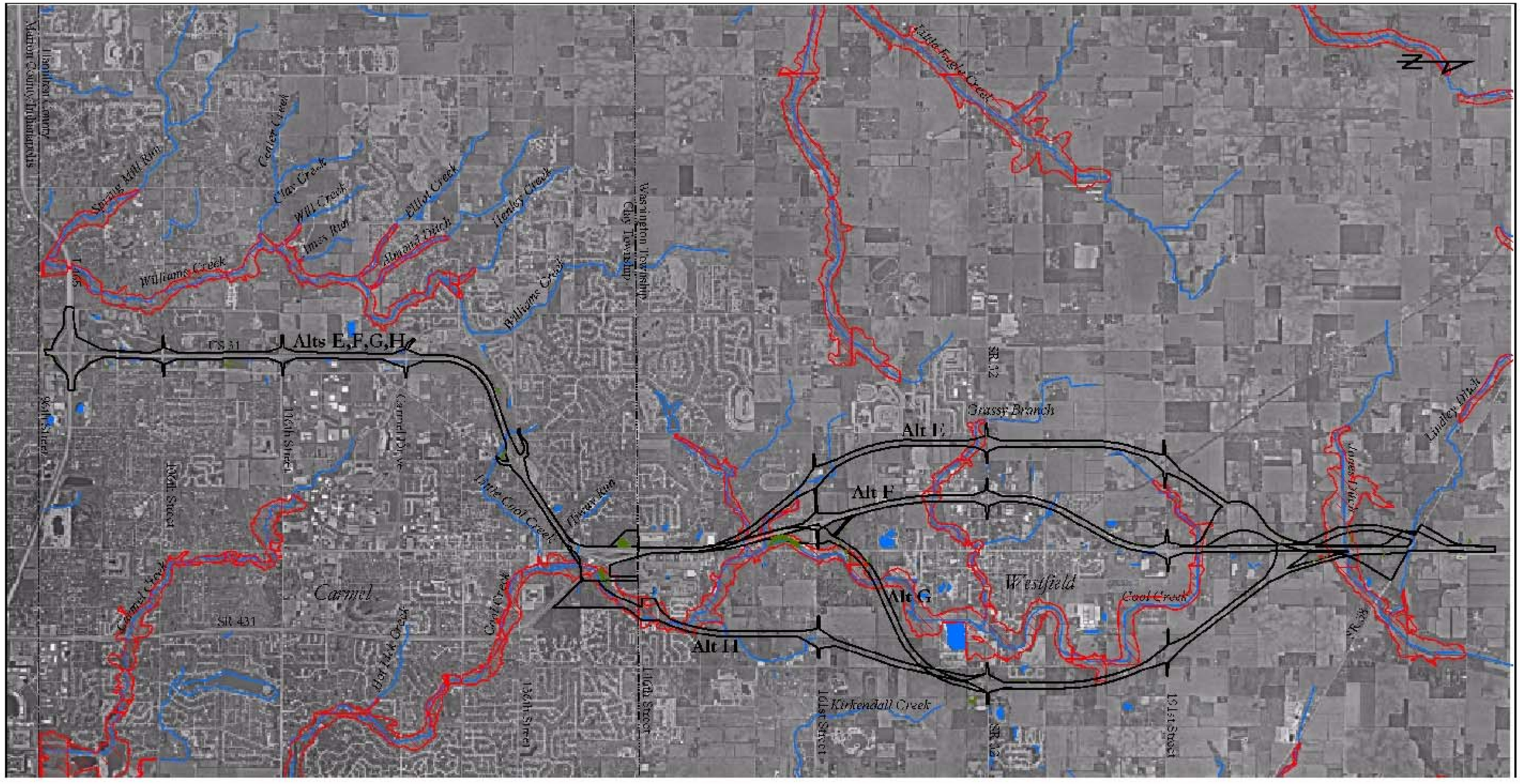
* Alternatives were not required to be consistent with criteria for Statewide Mobility Corridors to be advanced to Phase 2.

Table 3.1-2
Potential Impacts of Preliminary Alternatives Advanced to Phase 2 Screening

Category	Units	Alternatives			
		E	F	G	H
Land use:					
Agricultural	acres	262	101	254	327
Commercial	acres	82	104	79	68
Forestland	acres	77	58	85	72
Herbaceous rangeland	acres	0	0	0	0
Shrub/brush rangeland	acres	1	1	7	1
Industrial	acres	0	3	0	0
Institutional	acres	11	9	9	8
Open land	acres	1	1	1	1
Residential	acres	37	31	27	39
Under Construction	acres	0	0	0	0
Totals	**acres**	**471**	**308**	**462**	**516**
Relocations:					
Churches	number	1	1	1	1
Residences	number	36	42	30	36
Retail	number	10	26	8	12
Office	number	2	6	3	3
Library	number	0	0	0	0
Hospital	number	0	0	0	0
Industrial	number	0	1	0	0
Schools	number	0	0	0	0
School Properties:					
	number	0	1	0	0
	acres	0	1	0	0
Cemeteries:	number	0	0	0	0
Section 4(f) Property (Public parks and recreation areas)**:**	number	0	0	0	0
Emergency Facilities: Fire/Police	number	0	0	0	0
Hazardous Materials Sites:					
	number	4	11	4	3
	acres	2	5	3	3
Major Utilities:	number	11	12	12	12
Wetlands:					
Forested	acres	10	3	8	20
Scrub/shrub	acres	0	0	0	0
Emergent	acres	1	1	1	1
Total	**acres**	**11**	**4**	**9**	**21**
Open Water (ponds, lakes, etc.):	acres	2	2	2	3
Streams:	crossings	15	12	11	12
	linear feet	7780	5170	4715	9130
Floodplains:					
Floodways	number	4	5	4	3
100-year floodplains	number	4	4	4	3
	acres	45	38	54	80
Soils:					
Prime farmland	acres	209	71	242	301
Archaeological:					
Archaeological sites	number	6	7	5	5
	acres	2	2	2	1
High probability areas	acres	113	84	68	125
Historic:					
Listed/Eligible	number	1	2	1	1
Potential	number	2	3	3	2
Costs:					
Construction Cost	$ million	351	299	345	328
Right-of-way cost	$ million	73	101	70	68
Total Cost	**$ million**	**424**	**400**	**415**	**396**
Carried forward for detailed Study*		**No**	**Yes**	**Yes**	**No**

*<u>*No-Action Alternative*</u> – Although this alternative would not meet the project's purpose and need, it serves as a baseline when comparing the effectiveness and potential impacts of other alternatives and was, therefore, carried forward for detailed study.

Note: The impacts in this table were tabulated using existing secondary source data and conceptual design parameters.

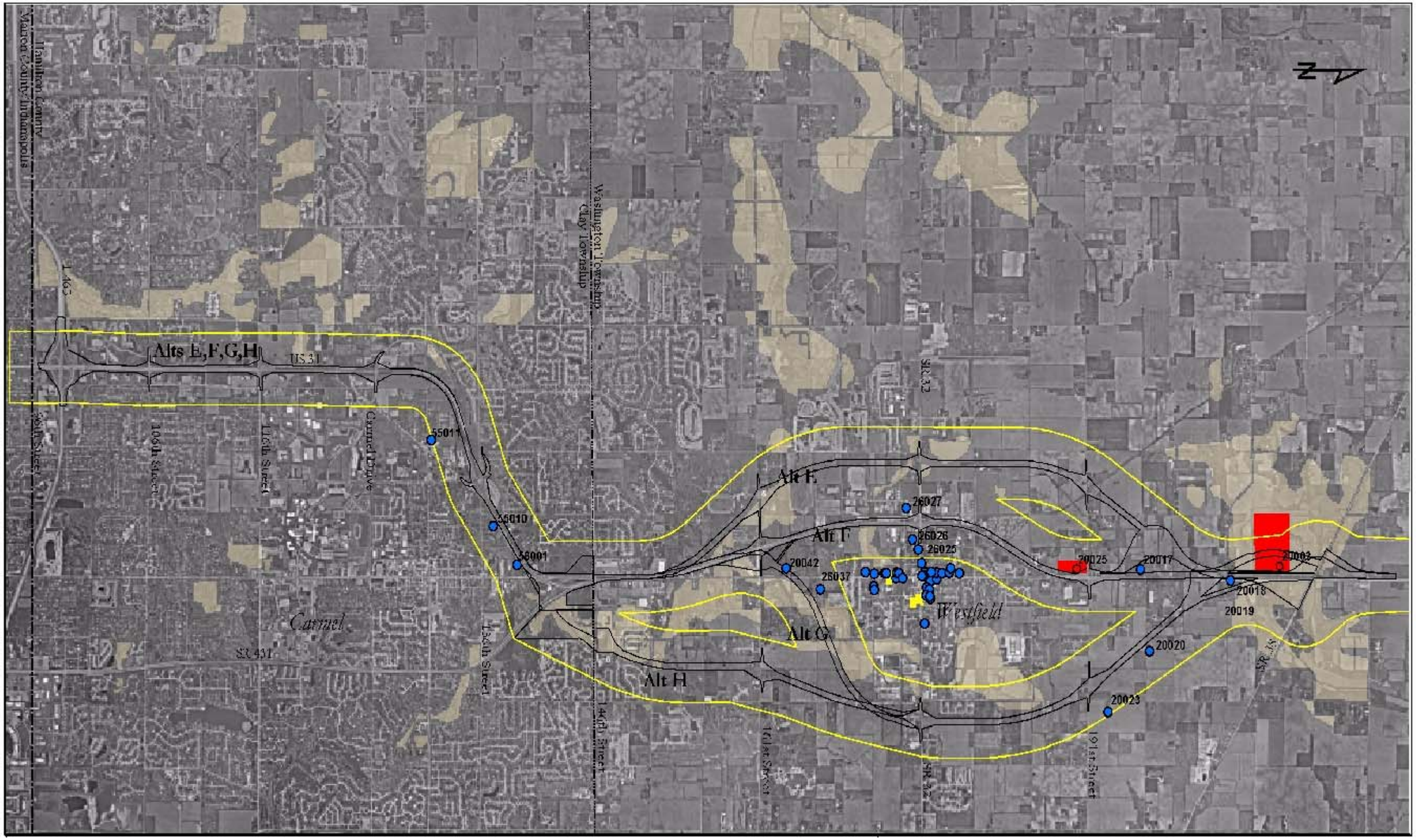


Legend:

- Proposed Preliminary Alternative
- Stream
- Open Water
- 100-year Floodplain
- NWI Wetland

Aerial Source: Hamilton County

FIGURE 3.1-1
Wetlands and Floodplains
Preliminary Alternatives Analysis and Screening
Draft Environmental Impact Statement
Hamilton County, Indiana



Legend:

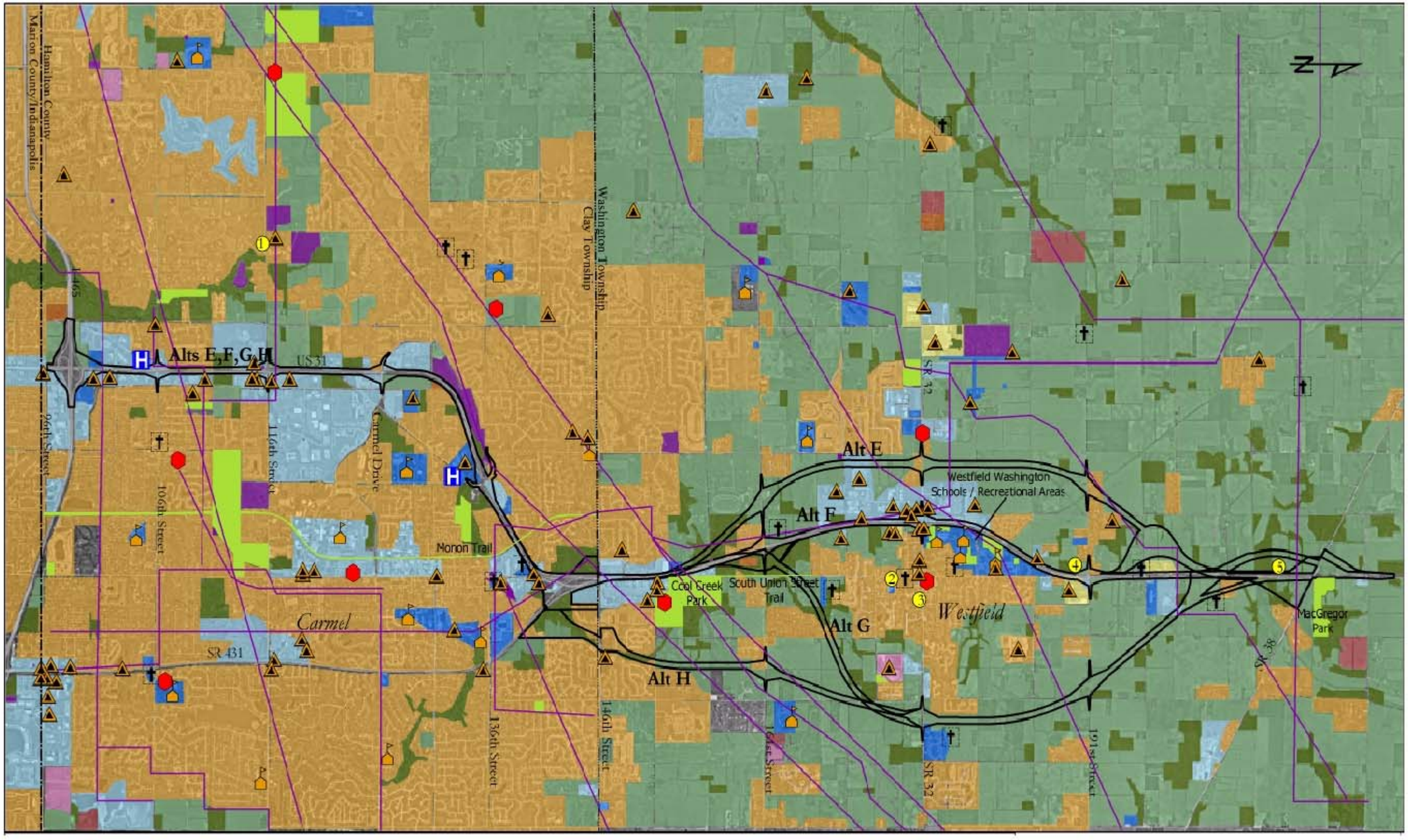
- Proposed Preliminary Alternative
- Area of Potential Effect (APE)
- High Probability Archeological Zones
- Potentially Historic Structure
- Eligible Historic Site / Structure
- Listed / Eligible Historic District

Note: The locations of archaeological sites are not shown on this map at the request of the IDNR.

Note: Sites with the historic status of listed or eligible for the HHRP (denoted here in red and yellow) are also recognized as Section 4(f) properties, shown as 4(f)Historic on the Land Use Figure.

Aerial Source: Hamilton County

FIGURE 3.1-2
Historic and Archaeological Resources
Preliminary Alternatives Analysis and Screening
Draft Environmental Impact Statement
Hamilton County, Indiana

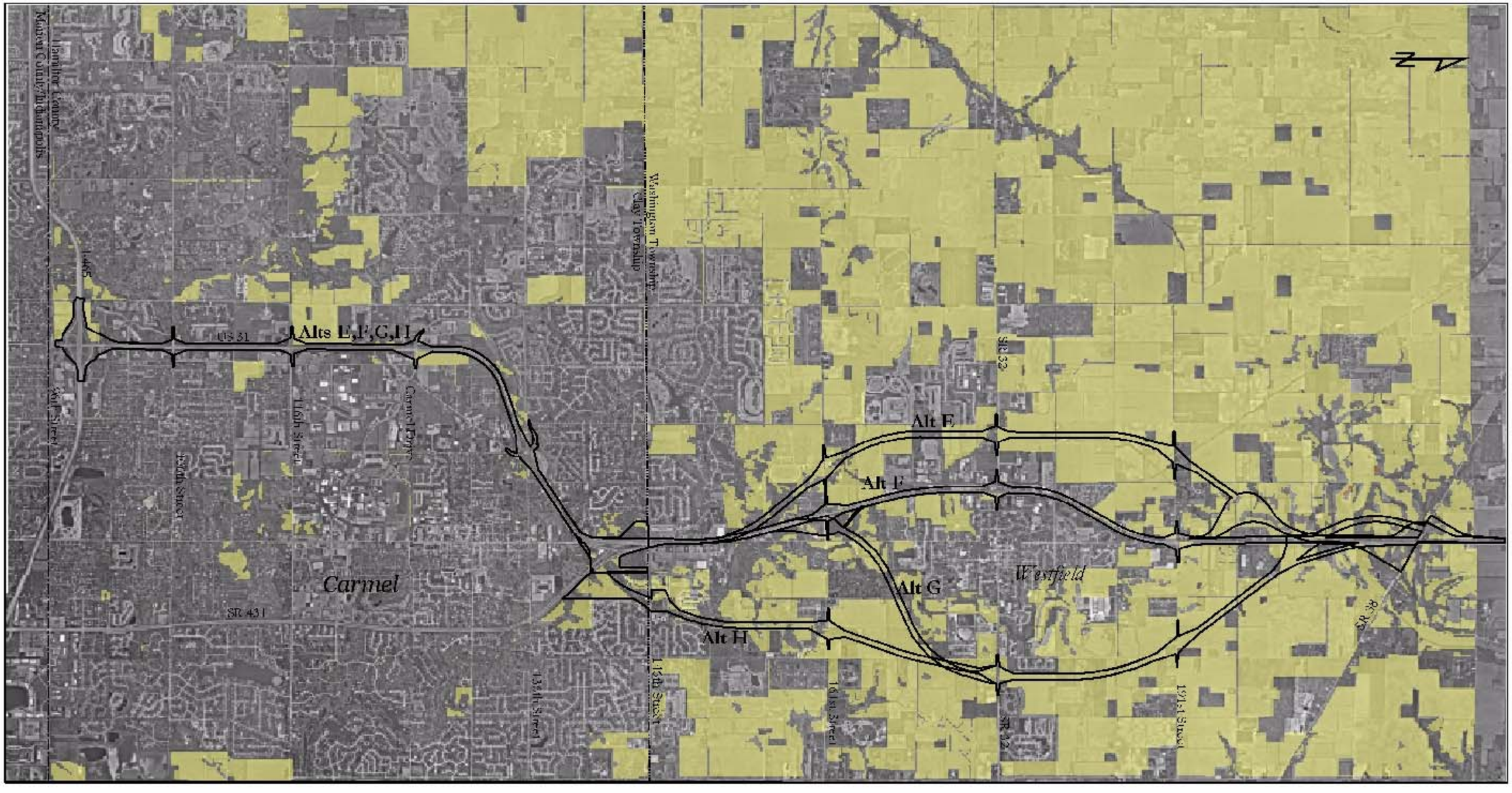


Legend:

- Proposed Preliminary Alternatives
- Hospital
- Cemetery
- School
- Fire or Police Station
- Hazardous Materials Site
- Major Utility Lines
- Army Munitions
- 4(f) Public Parkland
- 4(f) Historic Sites
  1. Miles Newby House
  2. Union High Academy Historic District
  3. Westfield Historic District
  4. Hunt House
  5. Lindley Farm
- Landuse
  - Agricultural
  - Commercial
  - Forest, Land
  - Farmhouse/Bungalow
  - Industrial
  - Institutional
  - Open Land
  - Residential
  - Shrub/Brush Rangeland
  - Under Construction

Aerial Source: Hamilton County

FIGURE 3.1-3
Land Use
Preliminary Alternatives Analysis and Screening
Draft Environmental Impact Statement
Hamilton County, Indiana



Legend:

Proposed Preliminary Alternative

Soil

Prime Farmland

Statewide Importance

US31 IMPROVEMENT PROJECT

Aerial Source: Hamilton County

FIGURE 3.1-4
Prime Farmland
Preliminary Alternatives Analysis and Screening
Draft Environmental Impact Statement
Hamilton County, Indiana

3.1.2 No-Action Alternative

The No-Action Alternative assumes that all of the projects in the current Indianapolis Metropolitan Planning Organization (MPO) Year 2025 Regional Transportation Plan would be implemented with the exception of the US 31 Improvement Project. Improvements planned in or near the project area include:

- Northbound connector from SR 431(Keystone Avenue) to 146th Street
- Widening SR 431 from four lanes to six lanes from 96th Street to US 31
- Northeast Corridor (NEC) "Connections" project
    - Adding travel lanes to I-465 north leg from US 31 east to I-70
    - Adding travel lanes to I-69 from I-465 north to SR 238
- Adding travel lanes to I-465 (north leg) from US 421 to US 31
- Construction of a new four-lane local roadway, Illinois Street, from 103rd Street to 136th Street
- Widening 116th Street from two lanes to four lanes from Rangeline Road east to Gray Road
- Widening 126th Street from two lanes to four lanes from Pennsylvania Street east to Adams Street
- Widening Old Meridian Street from two lanes to four lanes from Pennsylvania Street east to Guilford Boulevard
- Widening from two lanes to five lanes of SR 32 from 1.6 miles west of US 31 (Spring Mill Road) to US 31
- A placeholder for increased capacity along SR 32 from US 31 to 2.6 miles east of US 31 (Moontown Road)

Proposed transportation improvements are placed in two categories: programmed and placeholder. If a proposed improvement is programmed, the project has received sufficient study to be included in INDOT's long range transportation plan. Placeholders are categories for proposed improvements that offer a solution to an identified transportation problem. These placeholder projects are typically in the early stages of the planning process and additional study is required to determine the preferred improvement.

Additionally, the Indianapolis MPO Plan includes TDM and TSM programs and policies intended to reduce travel demand and increase the efficiency of the existing transportation system. These TDM and TSM programs are included in the MPO regional travel demand model for future years.

Phase 1: Purpose and Need

Traffic Congestion: This alternative would not reduce congestion on US 31. Currently, seven of the 15 signalized intersections operate at an unacceptable LOS during a peak hour. By 2025, 13 of the 15 intersections are projected to operate with unacceptable levels of service (Table 2.2-1 and Figures 2.1-2 through 2.1-3).

Traffic Safety: This alternative would not improve safety on US 31. Currently, six of the ten roadway segments on US 31 experience crash rates greater than the statewide average for similar

facilities (Figure 2.2-1). In addition, seven of the ten segments have injury crash rates greater than the statewide average (Figure 2.2-2). Without a reduction in traffic demand, the reassignment of trips to a higher-order facility, or a change in facility type, safety would not be improved.

Consistency with Transportation Plans: This alternative is not consistent with INDOT's Long Range Plan and regional transportation plans that call for improvements to US 31.

Conclusion
The No-Action Alternative would not address the purpose and need for this project. However, this alternative was carried forward for evaluation in the DEIS to serve as a baseline when comparing the effectiveness and potential impacts of other alternatives.

3.1.3 Travel Demand Management (TDM) Alternatives

TDM alternatives are relatively low-cost methods of reducing travel demand and improving traffic flow. These alternatives consist of programs or policies focused on either reducing the number of vehicles on the roadway or distributing trips to less congested periods of the day. The goal of TDM is to relieve peak hour traffic congestion.

Vanpooling/Carpooling. Vanpooling and/or carpooling programs primarily target work trips and are typically implemented to increase vehicle occupancy and reduce the total number of auto trips. Successful programs require a concentration of workers living in close proximity and destined for the same location, such as a major office development or central business district. No significant vanpooling/carpooling programs are currently active in Hamilton County.

Non-motorized Facility Enhancements. Walking and bicycling are the two primary non-motorized transportation modes with the potential to reduce automobile trips by offering a travel alternative for a variety of trip types. However, these modes are only effective for short trips – approximately one mile for walking and six miles for bicycling – and in favorable weather conditions.

Presently, there are no sidewalks or shared-use (multi-use) paths along US 31. The Monon Trail, a shared-use path on a former railroad right-of-way, crosses under US 31 south of 146th Street near the US 31/SR 431 interchange. Several streets within the corridor are designated as bike routes, but are narrow and would not be able to safely accommodate both automobiles and bicycles without improvements..

Employer-Based Trip Reduction Program. An employer-based trip reduction strategy would combine several programs that would reduce travel demand during the peak hours. Presently, there are no significant employer sponsored trip reduction programs in the US 31 corridor. Strategies that could be implemented include:

- *Parking Management:* This program could include providing limited parking relative to the number of employees, charging a fee for parking or designating more desirable spaces for carpools and vanpools.

- *Financial Incentives:* Employers may provide tax-free subsidies to encourage employees to take other modes of transportation to work. A necessary element for success is the availability of transit or other modes that provide a competitive travel option.

- *Flexible Work Schedule*: Establishing flexible work schedules for employees is an attempt to reduce traffic congestion during peak periods. These work schedules include having employees begin or end their workday outside the traditional working hours or working compressed workweeks to reduce the number of work trips during the week.

- *Telecommuting*: This program allows employees to work from home one or more days during the week. This schedule results in a reduction of total number of work trips.

Phase 1: Purpose and Need
Traffic Congestion: This alternative would not noticeably reduce traffic congestion on US 31. The TDM alternatives considered for this project are expected to only minimally reduce traffic volumes on US 31.

Traffic Safety: This alternative would not improve safety on US 31. Without a reduction in daily traffic volume or a change in facility type, safety would not be improved.

Consistency with Transportation Plans: There are some TDM programs included in the Indianapolis MPO 2025 Regional Transportation Plan. However, this alternative is not consistent with the criteria in INDOT's Long Range Transportation Plan for Statewide Mobility Corridors.

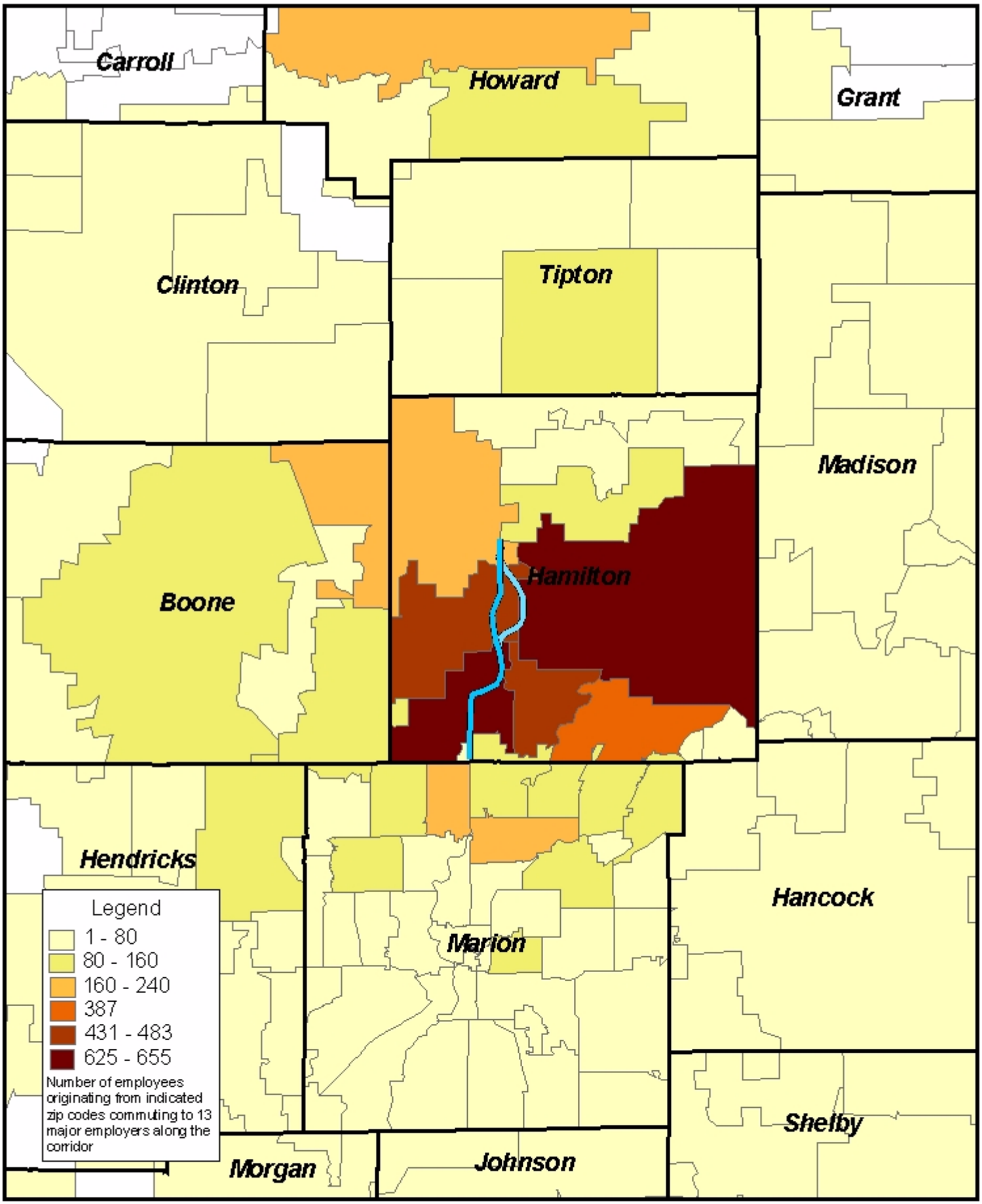
Conclusion
The TDM alternatives would not address the purpose and need of this project as "stand alone" alternatives because they would not significantly reduce congestion or improve safety. Therefore, they were not advanced to Phase 2 of the screening process as a "stand alone" alternative.

3.1.4 Transportation System Management (TSM) Alternatives

TSM alternatives are low-cost strategies of reducing traffic congestion and improving traffic flow. These alternatives consist of techniques or applications focused on improving the existing transportation network's ability to handle traffic volumes by making it more efficient.

Reversible Lanes. Reversible traffic lanes (lane control) provide the flexibility for the transportation system to respond to variations in traffic demand. If traffic flow is higher in one direction during certain hours of the day, reversing lanes provides the opportunity for capacity to more closely match demand. For example, lanes may operate inbound toward the central business district in the morning peak and outbound during the evening peak.

This alternative would not perform adequately on US 31. The traffic patterns do not indicate that the traffic volumes are significantly higher in one direction during certain times, especially on the southern section of US 31. The addition of reversible lanes would also drastically change the existing cross- section, removing the center median and replacing it with travel lanes. As a



US31 IMPROVEMENT PROJECT

Figure 3.1-5
US 31 Employer Zip Code Origin and Destination Study (AM)
Draft Environmental Impact Statement
Hamilton County, Indiana

result, this modified cross-section may increase the potential for higher accident rates. Therefore, reversible lanes are not a feasible option and were not advanced for further analysis.

Signal Coordination and Timing. Arterial signal systems timing programs can improve traffic flow in a corridor, increasing its efficiency. Conventional signal timing systems, like those installed on US 31, allow signals to respond to varying traffic conditions, including adjusting signal phasing and timing continuously depending on demand on each of the intersection's approaches. With the increased demand along US 31, current hardware and timing plans could be further updated and optimized to respond to these increases. The signalized intersections along the southern portion of US 31, where signal spacing is relatively short, are currently coordinated.

Intersection Improvements. Low-cost improvements at intersections can improve traffic flow through the corridor. This alternative includes adding dedicated turn lanes to US 31 and cross streets. The five intersections projected to have the worst levels of service in 2025 (106th, 116th, 126th Streets, Greyhound Pass and SR 32) were analyzed with additional turn lanes using no-action volumes. The results of this analysis indicate that levels of service would improve but would not satisfy INDOT standards (LOS D or better) at four of the five intersections. Table 3.1-3 displays the results of this analysis.

Table 3.1-3
Intersection Improvement Analysis Results

	2025 No-Action				2025 Intersection Improvement			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
106th Street	103	F	81	F	69	E	54	D
116th Street	137	F	170	F	103	F	141	F
126th Street/Carmel Drive	111	F	84	F	71	E	47	D
Greyhound Pass	70	E	46	D	50	D	40	D
SR 32	87	F	85	F	53	D	56	E

The following intersection improvements were implemented in the above analysis:

- 106th Street: Additional eastbound left turn lane and westbound left turn lane
- 116th Street:
  - Additional eastbound left turn lane and eastbound through lane
  - Additional westbound left turn lane
  - Reconfigure westbound lanes to two left turn lanes, two through lanes, and one right turn lane
- 126th Street: Additional left turn lane and right turn lane eastbound and westbound
- Greyhound Pass:
  - Additional northbound left turn lane
  - Additional eastbound right turn lane and westbound right turn lane
  - Reconfigure eastbound and westbound lanes to two left turn lanes, one through lane, and one right turn lane;
- SR 32: Additional eastbound left turn lane and westbound left turn lane (As part of the Indianapolis MPO Year 2025 Regional Transportation Plan, SR 32 would be widened at US 31 to include single dedicated left and right turn lanes and two through lanes eastbound and westbound).

Expanded ITS Applications. Intelligent Transportation System (ITS) applications include a variety of technology-based programs intended to actively manage the transportation system. The most common systems are designed to provide travel information on road conditions to daily commuters. Commuters can access this information and adjust their travel routes in response to changing traffic conditions. Television, radio, and the internet can receive a direct feed from a centralized traffic operation center providing real-time updates of traffic conditions. Information can also be provided by variable message signs along the roadway to alert drivers of approaching conditions.

Incident management programs are designed to improve reliability of the road and reduce the effect of incidents on travel delays by rapidly responding to correct a specific incident affecting traffic flow. This type of program is most effective in locations where traffic congestion is primarily incident related and does not occur on a regular basis. Incident Management can be integrated with ITS applications to divert traffic around an incident site.

Currently, INDOT operates an ITS system (TrafficWise) that, when fully operational, will detect congestion on metropolitan Indianapolis roadways. TrafficWise will monitor traffic and incidents and provide updates to motorists via radio or roadway message signs. There are currently 11 dynamic message signs within the Indianapolis area with plans to expand to 23. Additionally, TrafficWise operates the Hoosier Helper freeway service patrols to provide roadway assistance to stranded motorists.

For this project, the TSM alternative would include the full expansion of TrafficWise into the US 31 corridor.

Phase 1: Purpose and Need

Traffic Congestion: This alternative would not noticeably reduce recurring traffic congestion on US 31. Projected service levels would be LOS E or LOS F at four of the five intersections analyzed if signal coordination and intersection improvements were implemented.

Traffic Safety: This alternative would not improve safety on US 31. Without a reduction in travel use or a change in facility type, safety would not be improved.

Consistency with Transportation Plans: There are some TSM programs included in the Indianapolis MPO 2025 Regional Transportation Plan. However, this alternative is not consistent with the criteria in INDOT's Long Range Transportation Plan for Statewide Mobility Corridors.

Conclusion

The TSM alternatives would not address the purpose and need of this project as "stand alone" alternatives because they would not significantly reduce congestion or improve safety. Therefore, they were not advanced to Phase 2 of the screening process as a "stand along" alternative.

3.1.5 Mass Transit Alternatives

Transit service in the Indianapolis region consists of a bus-only transit system operated by IndyGo. Service is currently not available in Hamilton County, with the service area ending at 96th Street, the Marion/Hamilton county line. No short-term plans are in place to expand the

region's bus service. As part of the Northeast Corridor Study, the Indianapolis MPO has studied transit improvements from downtown Indianapolis northeast to Noblesville and includes part of the US 31 project area. This study analyzed the feasibility and effects of various roadway improvements along with expanded bus and rail service within the area. One alternative included three express bus routes to Carmel, Fishers and Noblesville. The additional express service results in an additional 4,000 transit trips by 2025 compared to the 2025 No-Action. These additional transit trips would not significantly reduce traffic volumes within the project area.

In an area such as the US 31 corridor where trips are dispersed, transit service is not a viable option. Trips must be concentrated at both their origin and destination, with a number of individuals making relatively similar trips. This concentration of trips must include both the starting point, such as a residential development, and ending point, like a concentration of office development. Dispersed ridership results in insufficient revenue to cover a reasonable portion of operating costs.

The existing infrastructure and development patterns in the US 31 corridor are not well suited for transit service. Transit riders must be able to walk to the service from either their residence or a park and ride facility and then walk from the service to their final destination. Some transit providers are beginning to offer service in dispersed areas with new approaches, such as demand responsive services. Although these services often provide a needed service, particularly to those without access to an automobile, their effect on congestion is minimal.

Phase 1: Purpose and Need

Traffic Congestion: The Northeast Corridor Study (Indy MPO) predicted that alternatives with express bus routes in the US 31 corridor would show only a 2-3% reduction in traffic on US 31. Therefore, this alternative would not noticeably reduce traffic congestion on US 31. It is not reasonable to assume that enough travelers would divert to transit service to result in improvements to levels of service on US 31.

Traffic Safety: This alternative would not improve safety on US 31. Without a reduction in congestion or a change in facility type, safety would not be improved.

Consistency with Transportation Plans: This alternative is not consistent with the criteria in INDOT's Long Range Transportation Plan for Statewide Mobility Corridors.

Conclusion

The Mass Transit Alternative would not address the purpose and need of this project as a "stand alone" alternative because it would not significantly reduce congestion or improve safety. Therefore, the Mass Transit Alternative was not advanced to Phase 2 of the screening process as a "stand alone" alternative.

3.1.6 Transportation Management (TM) Alternative

Following the completion of the Preliminary Alternatives Analysis in July, 2002, a Transportation Management (TM) Alternative was developed as a combination of the Travel Demand Management (TDM), Transportation System Management (TSM), and Mass Transit Alternatives. This section describes the anticipated effectiveness of the TM Alternative.

The Corridor and its Travel Patterns

The US 31 corridor is characterized by an automobile-oriented transportation system that supports a suburban environment. Currently, there is no transit service in the corridor. Most employers have ample amounts of free parking, therefore, the primary means of travel in the corridor is by automobile.

At the request of the US EPA and the US Fish and Wildlife Service (Appendix C, Purpose and Need), the following origin and destination studies were performed:

- Thirteen of the sixteen largest employers in the US 31 study corridor provided employee zip code data that was used to derive statistics for AM work trips into the corridor. As shown in Figure 3.1-5, the data reveals that the origins of AM work trips into the corridor are spread fairly evenly throughout the surrounding area zip codes (darker areas represent a higher number of employees originating from that zip code). From Figure 3.1-5, the following is the approximate distribution of the AM work trips into the corridor:

  - 15% from zip codes north of the corridor
  - 35% from zip codes south of the corridor
  - 25% from zip codes east of the corridor
  - 25% from zip codes west of the corridor

  The data does not indicate pockets of density from which a significant amount of inbound trips originate.

- 1990 Census Transportation Planning Package Data was examined to identify AM home-based work trip travel patterns out of the corridor (at the time of this study, Census 2000 Transportation Planning Data was not available). The 1990 census data shows that 45% (6,071) of AM work trips out of the corridor (13,558) are bound for various parts of Hamilton County. These are trips going from relatively scattered origins to scattered destinations. Therefore, this 45% of the AM trips out of the corridor would likely not be significantly affected by the TM strategy.

  The census data also shows that an additional 47% (6,378) of AM work trips out of the corridor (13,558) are destined for Marion County. The following is the distribution of this 47%:

  - 17% (2,355) to northwest Marion County
  - 15% (1,976) to northeast Marion County
  - 9% (1,272) to the Indianapolis Central Business District (CBD)
  - 6% (775) to southern Marion County (southwest and southeast)

  Marion (47%), Hamilton (45%), and Howard (2%) Counties comprise the top three destinations of AM work trips originating from the US 31 corridor. The remaining 6% of the trips are fairly evenly distributed throughout the region.

In conclusion, the 1990 Census data demonstrates that, beyond the southern terminus of the study area (I-465), there is a fairly dispersed commuting pattern. As such, only 9% of the AM trips out of the US 31 corridor to Marion County are bound for the dense CBD of Indianapolis.

Conclusion

The examination of the AM travel patterns into and out of the corridor reveal a pattern of scattered trip origins and scattered trip destinations. These patterns are not conducive to a reduction in travel due to the Transportation Management Alternative.

Effectiveness of the TM Alternative

Travel Demand Management (TDM): The TDM component of the TM Alternative is designed to affect travel behavior for home-based work trips. Research shows that in travel markets where existing rates of single-occupant vehicle use are high and use of alternatives like transit and ridesharing are low, a policy to encourage use of the alternatives would have less effect than if same policy were applied to an environment where the starting shares for these alternatives are higher (FHWA, 1993). As described above, the transportation environment of the US 31 corridor, with its absence of transit and unlimited parking at employment sites, would be a difficult place for a TDM strategy to have a significant effect in reducing peak-hour congestion.

An FHWA report on TDM predicts for an area similar to the US 31 Study area, an area-wide TDM program (including transit improvements) could have reductions of between 5-37% for peak-hour Home-Based-Work trips to employers into the corridor. The 37% represents a very optimistic estimate of a mandatory program and a high percentage of employer participation. It is more reasonable to think that the reduction would probably be closer to the bottom of that range in the US 31 corridor.

Transportation System Management (TSM): The TSM portion of the TM Alternative focuses on the management of roadway capacity and seeks to maximize the efficiency of the existing transportation system. While it is thought that the TSM portion of the strategy would help to improve the overall flow of traffic through the network by alleviating some bottlenecks, it is not expected that the improvements would be significant.

Mass Transit: The transit component of the TM mainly targets peak-hour work trips. Transit is usually most effective when one, or preferably both, of the trip ends are concentrated in areas of higher density. The suburban environment and the observed travel patterns into and out of the corridor are not conducive to the success of transit. Therefore, the transit component of the TM strategy is predicted to have little effect on the reduction of peak-hour traffic.

The Northeast Corridor DEIS (Indianapolis Metropolitan Planning Organization) examined the possible effects of transit in the travel corridor extending from northeastern Indianapolis into southeastern Hamilton County. The report predicted that alternatives with express bus routes in the corridor would show only a 2-3% reduction in traffic on US 31.

Phase 1: Purpose and Need

Traffic Congestion: The TM Alternative seeks to maximize the benefits of TDM, TSM and Mass Transit by including complimentary programs. Combining the alternatives into one would not be effective in reducing peak-hour congestion in the US 31 corridor. Additionally, the reduction in congestion would not be significant enough to accommodate future growth and provide acceptable levels of service in the corridor in the future. Therefore, the TM Alternative would not meet the project's purpose and need.

Traffic Safety: This alternative would not improve safety on US 31. Without a reduction in travel use or a change in facility type, safety would not be improved.

Consistency with Transportation Plans: This alternative is not consistent with the criteria in INDOT's Long Range Transportation Plan for Statewide Mobility Corridors.

Conclusion

The TM Alternative would not address the purpose and need of this project because it would not significantly reduce congestion or improve safety. Therefore, the TM Alternative was not carried forward for detailed study as a DEIS Alternative.

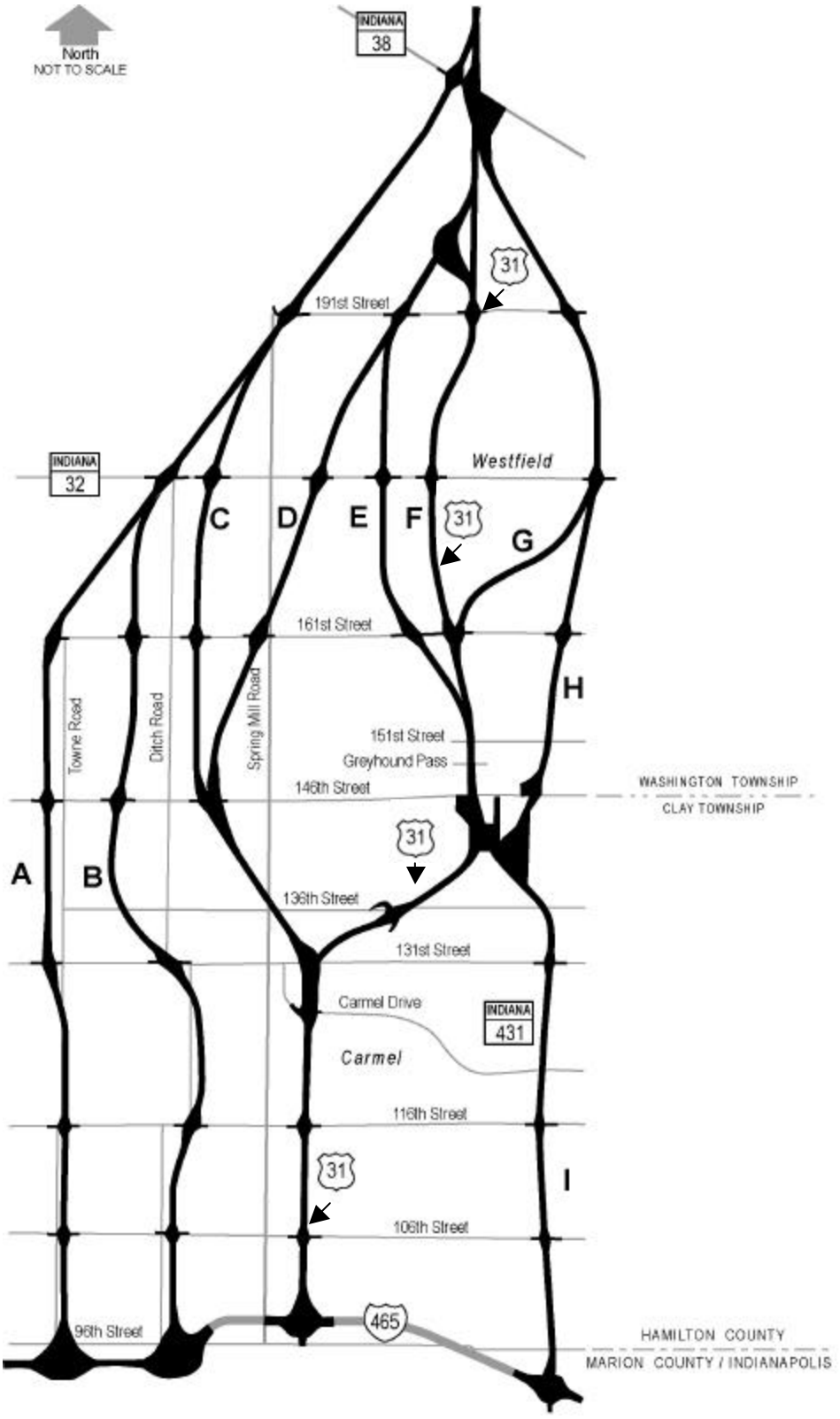
3.1.7 Highway Alternatives

Highway alternatives considered include widening US 31 to three through lanes in each direction (retaining partial access control) and freeway alternatives that ranged from improving US 31 and SR 431 to urban freeway standards on existing alignment to providing a new freeway facility on a completely new alignment. Most of these alternatives include a combination of both (See Figure 3.1-6).

Initially, on- and off-alignment freeway alternatives identified in the Major Investment Study (MIS), completed in March 1997, were considered. However, these alternatives were modified to include all feasible improvements while minimizing the number of impacts to residential and commercial areas. Examples of some of the modifications made include refinement to the interchange proposed at 146th Street to avoid impacts to commercial development and alternatives reducing the traffic along SR 32 through downtown Westfield. Additionally, comments from the June 2001 Public Meeting and Interagency Review Meeting held for this project were considered as part of the alternative refinement process.

For all freeway alternatives, a full access-controlled facility is assumed within a total right-of-way of 270 feet. Alternatives were developed assuming the same typical section and a standard interchange footprint to allow for a balanced and relative comparison of potential impacts. Alternatives advanced for evaluation in the DEIS would be refined to minimize impacts to the extent practicable.

Figure 3.1-6
Preliminary Freeway Alternatives



Widen US 31 Alternative

This alternative consists of widening US 31 to three through lanes in each direction throughout the project area, while retaining the existing at-grade intersections.

Phase 1: Purpose and Need

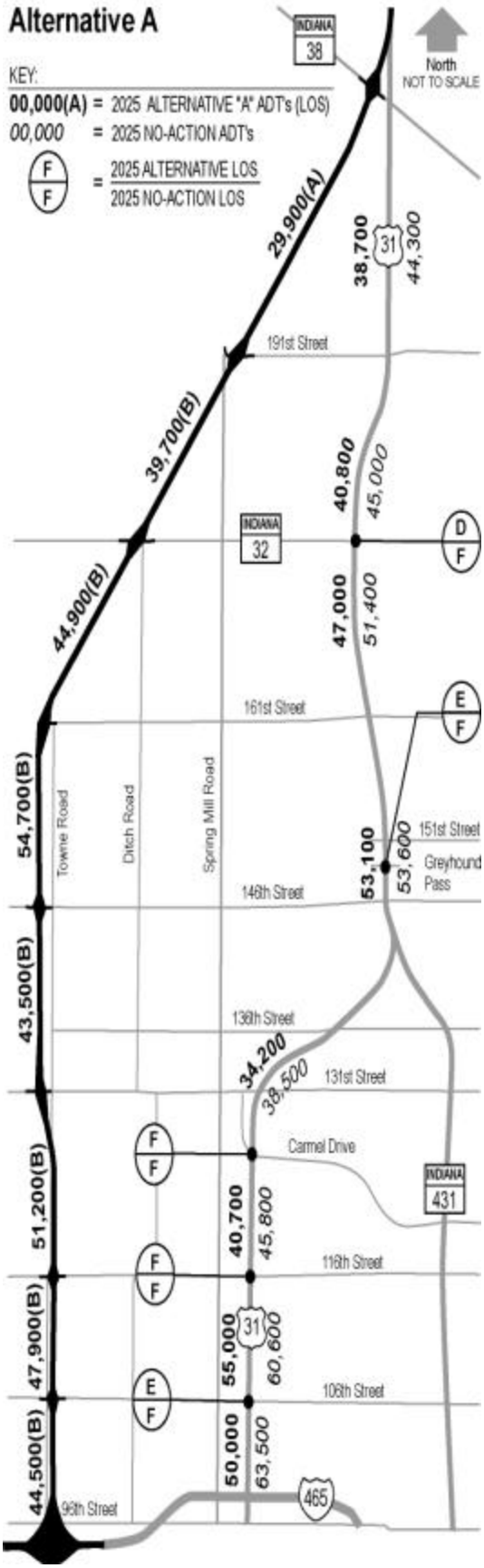
Traffic Congestion: Even with the additional capacity, this alternative would not adequately reduce traffic congestion on US 31. All five of the intersections analyzed are projected to operate at LOS F in the future with this alternative.

Traffic Safety: Without a reduction in daily traffic or a change in facility type, safety would not be improved.

Consistency with Transportation Plans: This alternative is not consistent with the criteria in INDOT's Long Range Transportation Plan for Statewide Mobility Corridors.

Conclusion

The Widen US 31 Alternative would not adequately reduce congestion thus not addressing the purpose and need of this project. Therefore, it was not advanced to Phase 2 of the screening process.



Alternative A

Alternative A would provide a new freeway off the existing US 31 alignment. It is the westernmost alternative considered for this project and is approximately 14 miles in length. Alternative A's southern terminus is I-465, where a system interchange would be provided. This alternative generally parallels Towne Road between I-465 and 161st Street. North of 161st Street, the alternative turns to the northeast to tie into US 31. Interchanges are tentatively proposed (locations remain under review and are subject to change) at 106th, 116th, 131st, 146th, 161st Streets, SR 32, 191st Street, and SR 38.

Phase 1: Purpose and Need

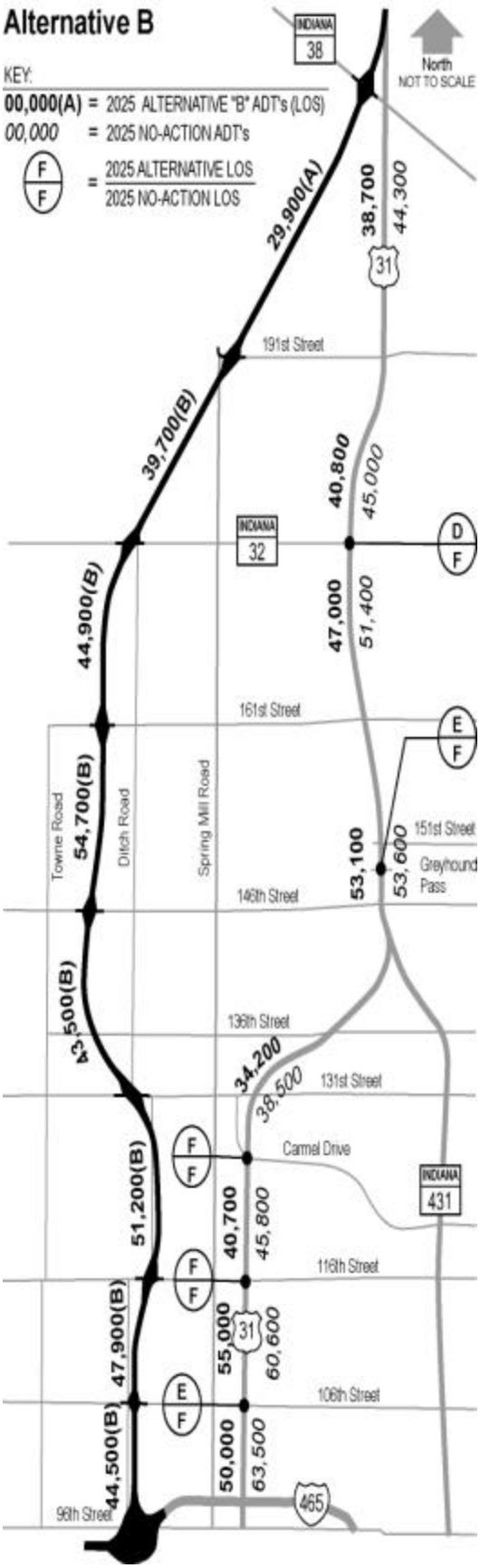
Traffic Congestion: Congestion is reduced for the vehicles diverting and utilizing the new freeway facility, as projected levels of service are A and B. Congestion is also reduced along existing US 31 causing three of the five intersections to have improved levels of service. However, four of the intersections still do not meet the INDOT standard of LOS D or better. Therefore, this alternative does not meet purpose and need.

Traffic Safety: Compared to the No-Action Alternative, some improvements in safety would be expected with this alternative. However, since substantial reassignment of trips to the higher-order freeway is not projected, improvements to safety would be minimal.

Consistency with Transportation Plans: This alternative would be consistent with the criteria in INDOT's Long Range Transportation Plan for Statewide Mobility Corridors.

Conclusion

Alternative A would result in minimal reductions in traffic congestion along the existing sections of US 31. Therefore, Alternative A would not meet the purpose and need of the project and was not advanced to Phase 2 of the screening process.



Alternative B

Alternative B would provide a new freeway facility, approximately 14 miles in length, off the existing US 31 alignment. The southern terminus for this alternative is I-465, where a system interchange would be provided. Between I-465 and 126th Street, the alternative generally parallels Ditch Road. Between 126th Street and 161st Street, the alternative is located between Ditch Road and Towne Road. North of 161st Street, the alternative turns to the northeast, matching Alternative A, to tie into US 31. Interchanges are tentatively proposed (locations remain under review and are subject to change) at 106th, 116th, 131st, 146th, 161st Streets, SR 32, 191st Street, and SR 38.

Phase 1: Purpose and Need

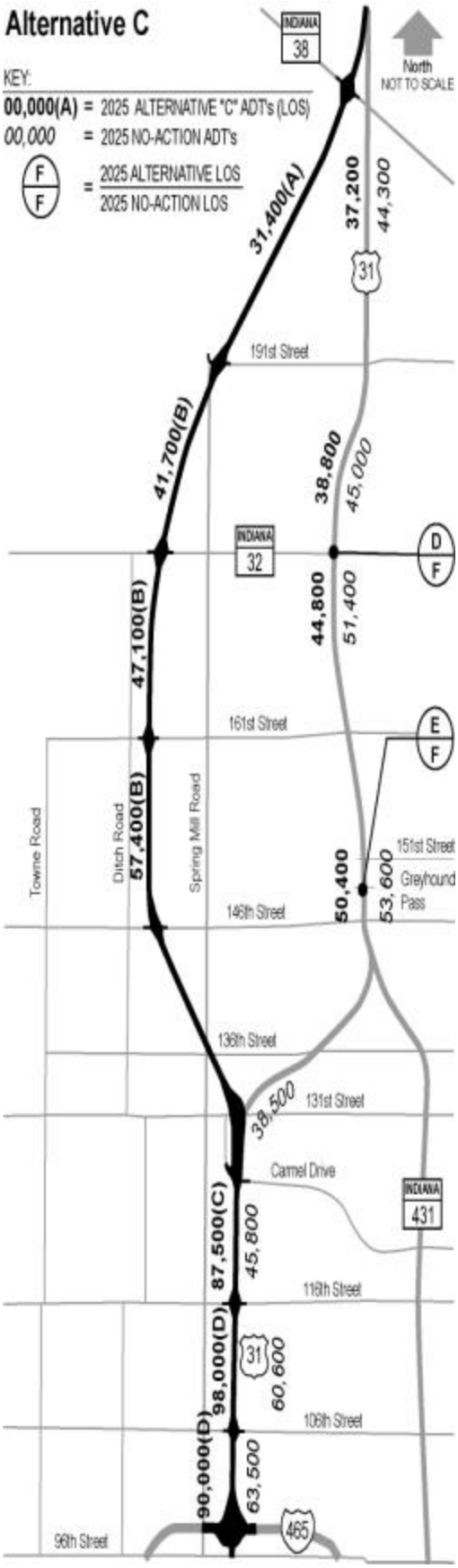
Traffic Congestion: Congestion is reduced for the vehicles diverting and utilizing the new freeway facility, as projected levels of service are A and B. Congestion is also reduced along existing US 31 causing three of the five intersections to have improved levels of service. However, four of the intersections still do not meet the INDOT standard of LOS D or better. Therefore, this alternative does not meet purpose and need.

Traffic Safety: Compared to the No-Action Alternative, some improvements in safety would be expected with this alternative. However, since substantial reassignment of trips to the higher-order freeway is not projected, improvements to safety would be minimal.

Consistency with Transportation Plans: This alternative would be consistent with the criteria in INDOT's Long Range Transportation Plan for Statewide Mobility Corridors.

Conclusion

Alternative B would result in minimal reductions in traffic congestion along the existing sections of US 31. Therefore, Alternative B would not meet the purpose and need of the project and was not advanced to Phase 2 of the screening process.



Alternative C

Alternative C would provide a freeway upgrade along existing US 31 between I-465 and 131st Street. Between 131st Street and SR 38, a new off-alignment freeway is proposed west of US 31. North of 191st Street, Alternative C matches Alternative A and Alternative B. The total length of the new "off alignment" freeway segment is approximately 10 miles, while the upgrade of existing US 31 segment is approximately 3 miles. An interchange is tentatively proposed at 131st Street to connect the existing US 31 corridor with the new freeway. Interchanges are tentatively proposed (locations remain under review and are subject to change) at 106th, 116th, 126th, 146th, 161st Streets, SR 32, 191st Street, and SR 38.

Phase 1: Purpose and Need

Traffic Congestion: Congestion is reduced for the vehicles diverting and utilizing the new freeway facility, as projected levels of service range from A to D. Congestion is also reduced along existing US 31 causing both intersections to have improved levels of service. However, the Greyhound Pass intersection does not meet the INDOT standard of LOS D or better. Therefore, this alternative does not meet purpose and need.

Traffic Safety: Compared to the No-Action Alternative, some improvements in safety would be expected with this alternative. However, since substantial reassignment of trips to the higher-order freeway is not projected, improvements to safety would be minimal through that area.

Consistency with Transportation Plans: This alternative would be consistent with the criteria in INDOT's Long Range Transportation Plan for Statewide Mobility Corridors.

Conclusion

Alternative C would result in minimal reductions in traffic congestion along the unimproved sections of US 31. Therefore, Alternative C would not meet the purpose and need of the project and was not advanced to Phase 2 of the screening process.

Alternative D

Alternative D would provide a freeway upgrade along existing US 31 between I-465 and 131st Street. Between 131st Street and SR 38, a new off-alignment freeway is proposed west of US 31. Interchanges would be tentatively provided at 131st Street and north of 191st Street where the new alignment ties into existing US 31. Interchanges are tentatively proposed (locations remain under review and are subject to change) at 106th, 116th, 126th, 146th, 161st Streets, SR 32, 191st Street, and SR 38.

Phase 1: Purpose and Need

Traffic Congestion: Congestion is reduced for the vehicles diverting and utilizing the new freeway facility, as projected levels of service range from A to D. Congestion is also reduced along existing US 31 causing both intersections to have improved levels of service. However, the Greyhound Pass intersection does not meet the INDOT standard of LOS D or better. Therefore, this alternative does not meet purpose and need.

Traffic Safety: Compared to the No-Action Alternative, some improvements in safety would be expected with this alternative. However, since substantial reassignment of trips to the higher-order freeway is not projected, improvements to safety would be minimal through that area.

Consistency with Transportation Plans: This alternative would be consistent with the criteria in INDOT's Long Range Transportation Plan for Statewide Mobility Corridors.

Conclusion

Alternative D would result in minimal reductions in traffic congestion along the unimproved sections of US 31. Therefore, Alternative D would not meet the purpose and need of the project and was not advanced to Phase 2 of the screening process.

Alternative E

Alternative E would consist of upgrading existing US 31 to freeway standards between I-465 and 151st Street. Between 151st Street and SR 38, a new off-alignment freeway is proposed to the west of US 31. The new alignment matches alternative D, north of 191st Street. Approximately seven miles of this alternative would be on new alignment. The US 31/SR 431 interchange would be redesigned to provide all movements between US 31, SR 431 and 146th Street. Interchanges are tentatively proposed (locations remain under review and are subject to change) at 106th, 116th, 126th, 136th, 161st Streets, SR 32, 191st Street, and SR 38. Interchanges are tentatively proposed north of 151st Street and north of 191st Street in order to provide access to existing US 31.

Phase 1: Purpose and Need

Traffic Congestion: This alternative would result in an improved level of service at SR 32. Compared to the No-Action Alternative, the LOS at this location would improve from F to D, meeting INDOT standards. Projected freeway levels of service range from A through D and meet INDOT standards.

Traffic Safety: This alternative would improve safety on US 31 by reducing travel demand on the non-freeway facility and changing the facility type.

Consistency with Transportation Plans: This alternative would be consistent with the criteria in INDOT's Long Range Transportation Plan for Statewide Mobility Corridors.

Based on the aforementioned findings, Alternative E meets the project purpose and need and was advanced to Phase 2 of the screening process.

Phase 2: Environmental Impacts

The largest impacts to land use by this alternative occur to agricultural land (262 acres). The majority of these impacts occur between 151st Street and SR 38, where the alternative is located off-alignment. In addition, most of the agricultural land supports prime farmland soils (203 acres). The alternative would result in the displacement of approximately 34 single-family

residences and ten retail buildings. The majority of the residential displacements occur north of 146th Street and at the potential 136th Street interchange. Approximately eleven acres of wetlands would also be impacted. Alternative E would result in 15 stream crossings that would involve 7,780 linear feet of stream. As with the impacts to agricultural land, the majority of the stream impacts occur north of 151st Street where the alternative is located off-alignment. The potential cultural resource impacts associated with this alternative include six archaeological sites and one eligible historic site (i.e., Lindley Farm). As for public parks/recreational areas (i.e., Section 4(f) property), Alternative E would result in an aerial crossing of the Monon Trail between 136th Street and Rangeline Road. However, there would be no permanent or temporary use of the trail property.

Conclusion

Alternative E is being eliminated from further consideration based on a comparative analysis of impacts with other alternatives that were advanced to the Phase 2 screening process.

Alternative F

Alternative F would upgrade US 31 to freeway standards on the existing alignment between I-465 and SR 38. As part of this alternative, the US 31/SR 431 interchange would be redesigned to provide all movements between US 31, SR 431 and 146th Street. Interchanges are tentatively proposed (locations remain under review and are subject to change) at 106th, 116th, 126th, 136th, 161st streets, SR 32, 191st Street, and SR 38.

Phase 1: Purpose and Need

Traffic Congestion: This alternative would reduce congestion on US 31. Projected freeway levels of service range from B through D and meet INDOT standards. All existing at-grade intersections through the project area would be removed with this alternative.

Traffic Safety: This alternative would improve safety on US 31 by changing the facility type.

Consistency with Transportation Plans: This alternative would be consistent with the criteria in INDOT's Long Range Transportation Plan for Statewide Mobility Corridors.

Based on the aforementioned findings, Alternative F meets the project purpose and need and was advanced to Phase 2 of the screening process.

Phase 2: Environmental Impacts

The largest impacts to land use by this alternative occur to commercial property (104 acres). The alternative would result in the displacement of approximately 42 single-family residences and 26 retail buildings. The majority of the residential displacements occur north of 146th Street and at the potential 136th Street interchange while the majority of the retail displacements are concentrated around the SR 32 interchange area. Associated with the retail displacements are eleven hazardous material sites. Approximately four acres of wetlands would also be impacted. Alternative F would result in 12 stream crossings that would involve 5,170 linear feet of stream. Additionally, one of the Town of Westfield's wellhead protection areas would be impacted, however this area is currently disturbed by

the existing US 31 alignment. The potential cultural resource impacts associated with this alternative include seven archaeological sites and two eligible historic sites (i.e., Lindley Farm and Hunt House). In regard to the historic sites, no structures would be directly impacted, rather the direct impacts for these sites would consist of land/property use and access modification. As for public parks/recreational areas (i.e., Section 4(f) property), Alternative F would result in an aerial crossing of the Monon Trail between 136th Street and Rangeline Road. However, there would be no permanent or temporary use of the trail property. Alternative F would impact one acre of school property located on the northeast quadrant of the SR 32/US 31 interchange, adjacent to the Westfield High School football stadium. However, this land is not used for recreational purposes and therefore would not be considered a Section 4(f) use (Appendix C, Section 4(f)).

Conclusion

Alternative F is being carried forward for more detailed studies in the DEIS based on a comparative analysis of impacts with other alternatives that were advanced to the Phase 2 screening process.

Alternative G

Alternative G would consist of upgrading existing US 31 to freeway standards between I-465 and 161st Street. Between 161st Street and SR 38, a new alignment is proposed to the east of US 31. Approximately seven miles of this alternative would be on new alignment. The US 31/SR 431 interchange would be redesigned to provide all movements between US 31, SR 431 and 146th Street. Interchanges are tentatively provided (locations remain under review and are subject to change) at 106th, 116th, 126th, 136th, 161st Streets, SR 32, 191st Street, and SR 38. Interchanges are tentatively proposed north of 161st Street and north of 191st Street in order to provide access to existing US 31.

Phase 1: Purpose and Need

Traffic Congestion: This alternative would result in an improved level of service at SR 32. Compared to the No-Action Alternative, the LOS at this location would improve from F to D, meeting INDOT standards. Projected freeway levels of service range from A through D also meeting INDOT standards.

Traffic Safety: This alternative would improve safety on US 31 by reducing travel demand on the non-freeway section and changing the facility type.

Consistency with Transportation Plans: This alternative would be consistent with the criteria in INDOT's Long Range Transportation Plan for Statewide Mobility Corridors.

Based on the aforementioned findings, Alternative G meets the project purpose and need and was advanced to Phase 2 of the screening process.

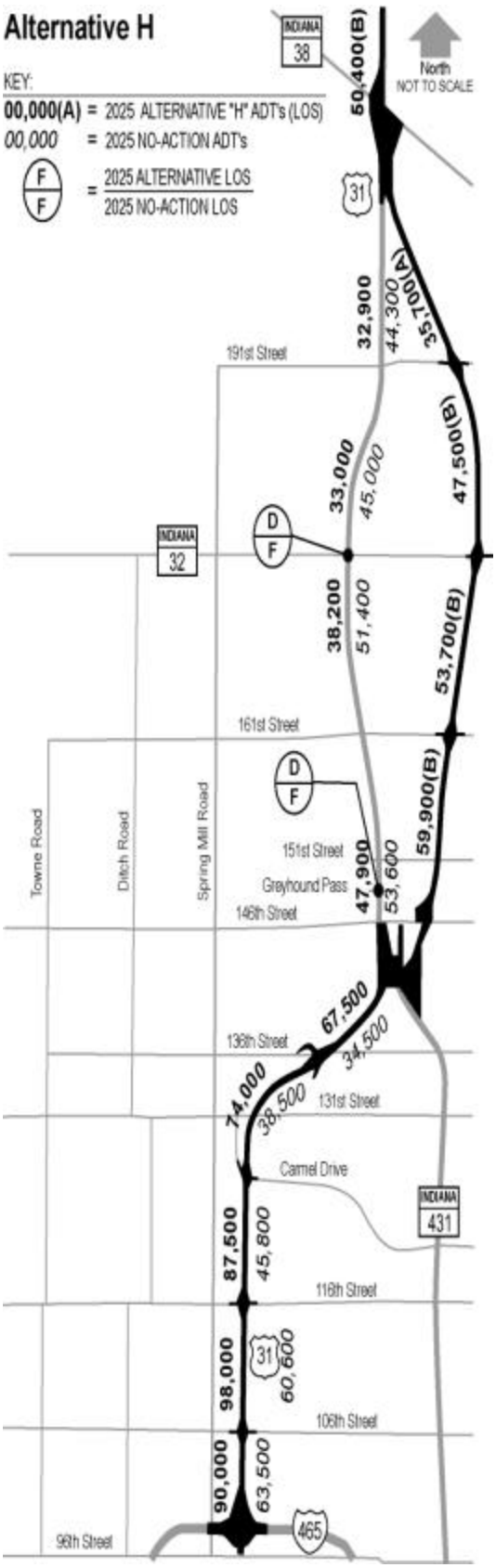
Phase 2: Environmental Impacts

The largest impacts to land use by this alternative occur to agricultural land (254 acres). The majority of these impacts occur between 161st Street and SR 38, where the alternative is located off-alignment. In addition, most of the agricultural land supports prime farmland soils (242 acres). The alternative would result in the displacement of approximately 30 single-family residences and 8 retail buildings. The majority of the

residential displacements occur north of 146th Street and at the potential 136th Street interchange. Approximately nine acres of wetlands would also be impacted. Alternative G would result in 11 stream crossings that would involve 4,715 linear feet of stream. The potential cultural resource impacts associated with this alternative include five archaeological sites and one eligible historic site (i.e., Lindley Farm). In regard to the historic site, no structures would be directly impacted, rather the direct impact would consist of land/property use. As for public parks/recreational areas (i.e., Section 4(f) property), Alternative G would result in an aerial crossing of both the Monon Trail and the South Union Street Trail. However, there would be no permanent or temporary use of the trail properties.

Conclusion

Alternative G is being carried forward for more detailed studies in the DEIS based on a comparative analysis of impacts with other alternatives that were advanced to the Phase 2 screening process.



Alternative H

Alternative H would consist of upgrading existing US 31 to freeway standards between I-465 and SR 431. Between SR 431 and SR 38, a new alignment is proposed to the east of US 31. North of SR 32, the alignment matches Alternative G. Approximately eight miles of this alternative would be on new alignment. The US 31/SR 431 interchange would be redesigned to provide all movements between US 31, SR 431 and 146th Street. Interchanges are tentatively provided (locations remain under review and are subject to change) at 106th, 116th, 126th, 136th, 161st Streets, SR 32, 191st Street, and SR 38. An interchange is proposed north of 191st Street in order to provide access to existing US 31.

Phase 1: Purpose and Need

Traffic Congestion: This alternative would result in improved levels of service at Greyhound Pass and SR 32. Compared to the No-Action Alternative, the LOS at these locations would improve from F to D, meeting INDOT standards. Projected freeway levels of service range from A through D also meeting INDOT standards.

Traffic Safety: This alternative would improve safety on US 31 by reducing travel demand on the non-freeway section and changing facility type.

Consistency with Transportation Plans: This alternative would be consistent with the criteria in INDOT's Long Range Transportation Plan for Statewide Mobility Corridors.

Based on the aforementioned findings, Alternative H meets the project purpose and need and was advanced to Phase 2 of the screening process.

Phase 2: Environmental Impacts

The largest impacts to land use by this alternative occur to agricultural land (327 acres). The majority of these impacts occur between 151st Street and SR 38, where the alternative is located off-alignment. In addition, most of the agricultural land supports prime farmland soils (301 acres). The alternative would result in the displacement of approximately 36 single-

family residences and 12 retail buildings. The majority of the residential displacements occur north of 146th Street and at the potential 136th Street interchange. Approximately 21 acres of wetlands would also be impacted. Alternative H would result in 12 stream crossings that would involve 9,130 linear feet of stream. The majority of the stream and floodplain impacts are associated with a longitudinal encroachment of Cool Creek between SR 431 and 151st Street. The potential cultural resource impacts associated with this alternative include five archaeological sites and one eligible historic site (i.e., Lindley Farm). In regard to the historic site, no structures would be directly impacted, rather the direct impact would consist of land/property use. As for public parks/recreational areas (i.e., Section 4(f) property), Alternative H would result in an aerial crossing of the Monon Trail between 136th Street and Rangeline Road. However, there would be no permanent or temporary use of the trail property.

Conclusion

Alternative H is being eliminated from further consideration based on a comparative analysis of impacts with other alternatives that were advanced to the Phase 2 screening process.

Alternative I

Alternative I would include a new directional interchange at I-465 and an upgrade of SR 431 to freeway standards to the US 31/SR 431 interchange. North of this interchange, the proposed freeway would continue along the US 31 alignment to SR 38. As part of this alternative, the US 31/SR 431 interchange would be redesigned to provide all movements between US 31, SR 431 and 146th Street. Interchanges are tentatively proposed (locations remain under review and are subject to change) at 106th, 116th, 131st, 161st streets, SR 32, 191st Street, and SR 38.

Phase 1: Purpose and Need

Traffic Congestion: Congestion is reduced for the vehicles diverting and utilizing the upgraded SR 431 freeway facility, as projected levels of service range from B to D. Congestion is also reduced along existing US 31 causing two of the three intersections to have improved levels of service. However, the three intersections south of 146th Street do not meet the INDOT standard of LOS D or better. Therefore, this alternative does not meet purpose and need.

Traffic Safety: Compared to the No-Action Alternative, some improvements in safety would be expected with this alternative. However, since substantial reassignment of trips to the higher-order freeway is not projected, improvements to safety would be limited through that area.

Consistency with Transportation Plans: This alternative would be consistent with the criteria in INDOT's Long Range Transportation Plan for Statewide Mobility Corridors.

Conclusion

Alternative I would result in minimal reductions in traffic congestion along the unimproved sections of US 31. Therefore, Alternative I would not meet the purpose and need of the project and was not advanced to Phase 2 of the screening process.

Interchange Options

As part of this evaluation, the potential locations of interchanges were explored. In the 1997 Major Investment Study (MIS), an interchange was recommended at 126th Street. For all freeway alternatives that are on the existing alignment through this area (i.e., Alternatives C, D, E, F, G and H), an interchange at this location was developed and evaluated. In addition, the City of Carmel has asked that INDOT consider an interchange at 131st Street. However, because of the proximity of these two interchanges (less than one mile apart), only one of the interchanges can be developed, according to INDOT design standards. The INDOT design standards state that the minimum interchange spacing in an urban area is one mile, while spacing in a rural area is three miles. However, access in the form of cross-road connections to collector-distributor (C-D) roadways may be acceptable if access spacing is less than one mile. Based on a preliminary evaluation of potential impacts at this time, neither interchange has any critical flaws or would result in substantially different impacts. As a result, more detailed engineering and traffic analysis are needed to better determine which interchange would be the most cost-effective while minimizing impacts. Therefore, both interchange options would be carried forward for further evaluation in the DEIS.

An interchange at 151st Street was also recommended in the MIS. An interchange at this location, however, would be less than one mile from the proposed interchange at 146th Street. Therefore, an individual or independent interchange at both locations cannot be developed according to INDOT design standards. Additionally, an interchange at 151st Street could result in the displacement of as many as five retail buildings and one office building. Because of these reasons, an independent interchange at 151st Street was not evaluated.

3.1.8 Preliminary Alternatives Eliminated from Further Consideration

The following Preliminary Alternatives were eliminated from further study for the reasons discussed below.

Widen US 31 Alternative: This alternative does not meet the purpose and need of the project.

TDM, TSM, and Mass Transit Alternatives: Individually, these alternatives do not meet the purpose and need of the project.

Transportation Management (TM) Alternative: This alternative includes a combination of TDM, TSM, and Mass Transit Alternatives. Cumulatively, this alternative does not meet the purpose and need of the project.

Alternatives A, B, C, D and I: These alternatives do not meet the purpose and need of the project.

Alternative E: Alternative E and Alternative G both avoid potential commercial and residential impacts along the existing US 31 corridor in the Westfield area. When comparing these two alternatives, Alternative E generally has greater overall impacts than Alternative G. It also has the highest number of stream crossings (15), the second greatest impacts to wetlands (11 acres), and more linear feet of streams (7,780 feet) when compared to all of the other preliminary alternatives. In addition, unlike Alternative G, Alternative E would not provide the added benefit of relieving traffic congestion on SR 32 through the Town of Westfield, which includes

potential Section 4(f)/106 sites. Therefore, due to greater overall impacts and lack of traffic congestion relief on SR 32, Alternative E was eliminated in favor of Alternative G.

Alternative H: Alternative H would require the most right-of-way (516 acres) and result in the greatest impacts to agricultural land (327 acres), prime farmland soil (301 acres), linear feet of streams (9,130 feet), floodplain areas (80 acres) and wetlands (21 acres). More specifically, the majority of the wetland, stream, and floodplain impacts are related to a longitudinal encroachment along Cool Creek between SR 431 and 151st Street. This area has been identified by the US Fish and Wildlife Service as a sensitive ecosystem that should be avoided. It also may be potential habitat for the federally endangered Indiana bat. Alternative H would result in greater impacts to natural resources than Alternative G.

3.1.9 Preliminary Alternatives Carried Forward for Further Analysis in the DEIS

The following Preliminary Alternatives were carried forward for detailed study.

No-Action Alternative
The No-Action Alternative assumes that all of the projects in the current Indianapolis MPO Long Range Transportation Plan would be implemented with the exception of improvements to US 31. This alternative would not meet purpose and need for the project but serves as a baseline when comparing the effectiveness and potential impacts of the other alternatives.

Alternative F*
In addition to meeting the project's purpose and need, Alternative F would require the least amount of right-of-way (308 acres) that results in the fewest impacts to agricultural land (101 acres), forestland (58 acres), floodplains (38 acres), wetlands (4 acres), and the second fewest impacts to linear feet of streams (5,170). The alternative would have the lowest construction cost and second lowest total cost. Alternative F would also be consistent with state and regional transportation plans.

Alternative G*
In addition to meeting the project's purpose and need, Alternative G would have the fewest single-family (30) and retail (8) displacements. The alternative would also have the least stream impacts (11 crossings/4,715 linear feet). Moreover, Alternative G reduces traffic demand along SR32 through the Town of Westfield, which includes a historic district and several other potential historic structures.

For the DEIS, both Alternative F and Alternative G would be developed and evaluated with and without interchanges at 126th and 131st streets. For all interchange locations, alternative configurations may be developed and evaluated. In addition, the traffic forecasts would be refined further for the alternatives that would be evaluated in the DEIS.

* Documented impacts are based on existing secondary source data and conceptual design parameters. These impacts are refined later in the DEIS.

3.2 Description of the Alternatives Selected for Detailed Study

From the Preliminary Alternative Analysis and Screening Report, the following three primary alternatives were carried forward for more detailed study in the DEIS:

- No-Action Alternative
- Alternative F
- Alternative G

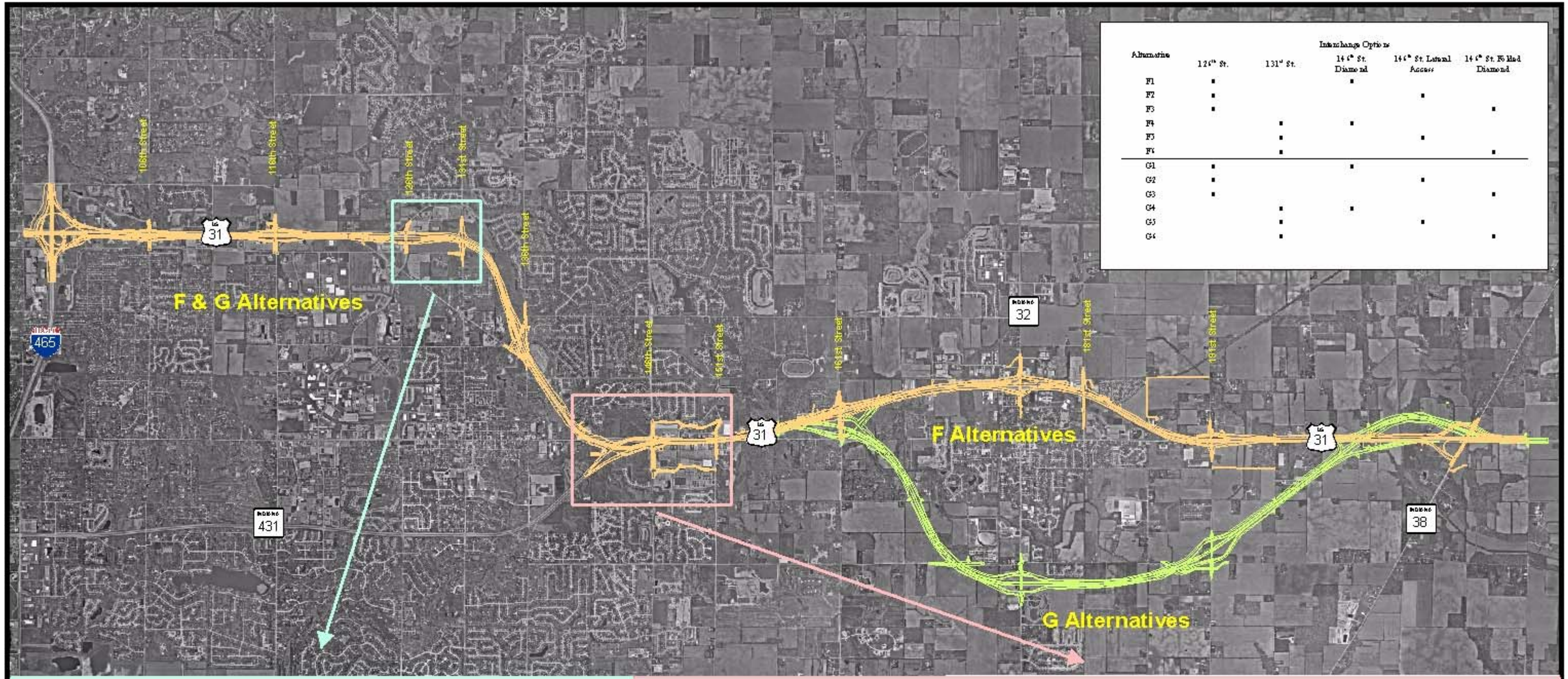
The build alternatives, Alternative F and Alternative G, were further refined and include three interchange options at 146th Street and an option between an interchange at 126th Street or 131st Street (Figure 3.2-1). The various combinations of these interchanges lead to six different alternatives for F (i.e., F1-F6) and six different alternatives for G (i.e., G1-G6). Table 3.2-1 presents each alternative and the interchange combinations. INDOT would continue to develop and assess interchange options from 126th Street to 151st Street in an effort to ensure satisfactory access to adjoining developments in the area.

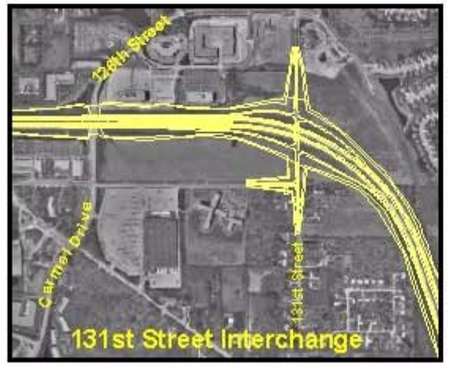
Table 3.2-1
Build Alternatives

Alternative	Interchange Options				
	126th St./ Carmel Drive*	131st St.**	146th St. Diamond	146th St. Lateral Access	146th St. Folded Diamond
F1	**X**		**X**		
F2	**X**			**X**	
F3	**X**				**X**
F4		**X**	**X**		
F5		**X**		**X**	
F6		**X**			**X**
G1	**X**		**X**		
G2	**X**			**X**	
G3	**X**				**X**
G4		**X**	**X**		
G5		**X**		**X**	
G6		**X**			**X**

* Diamond Interchange at 126th Street/Carmel Drive; US 31 passes under 131st Street
** Interchange at 131st Street; US 31 passes over 126th Street

Alternative	Interchange Options				
	126th St.	131st St.	146th St. Diamond	146th St. Lateral Access	146th St. Folded Diamond
F1	■		■		
F2	■			■	
F3	■				■
F4		■	■		
F5		■		■	
F6		■			■
G1	■		■		
G2	■			■	
G3	■				■
G4		■	■		
G5		■		■	
G6		■			■





US31 IMPROVEMENT PROJECT

Aerial Source: Hamilton County, Indiana

0 0.5 1 Mile

FIGURE 3.2-1
F & G Alternatives
Including Interchange Options
Draft Environmental Impact Statement
Hamilton County, Indiana

3.2.1 No-Action Alternative

Consistent with requirements of NEPA and related FHWA guidelines, full consideration was given to the impacts of taking no action to provide a basis of comparison with other alternatives. The No-Action Alternative involves the continuation of the existing transportation system on US 31 from I-465 to SR 38 through the year 2025. The No-Action Alternative, while having no *direct* construction costs or impacts, would result in indirect economic, environmental, and social impacts due to the continued deterioration of level of service as identified in the Purpose and Need.

The No-Action Alternative assumes that all of the following planned or programmed INDOT and local transportation projects would be developed except US 31 improvements:

- Northbound connector from SR 431(Keystone Avenue) to 146th Street
- Widening SR 431 from four lanes to six lanes from 96th Street to US 31
- Northeast Corridor (NEC) "Connections" project
    - Adding travel lanes to I-465 north leg from US 31 east to I-70
    - Adding travel lanes to I-69 from I-465 north to SR 238
- Adding travel lanes to I-465 (north leg) from US 421 to US 31
- Construction of a new four-lane local roadway, Illinois Street, from 103rd Street to 136th Street
- Widening 116th Street from two lanes to four lanes from Rangeline Road east to Gray Road
- Widening 126th Street from two lanes to four lanes from Pennsylvania Street east to Adams Street
- Widening Old Meridian Street from two lanes to four lanes from Pennsylvania Street east to Guilford Boulevard
- Widening from two lanes to five lanes of SR 32 from 1.6 miles west of US 31 (Spring Mill Road) to US 31
- A placeholder for increased capacity along SR 32 from US 31 to 2.6 miles east of US 31 (Moontown Road)

3.2.2 Alternatives F1 through F6

Alternatives F1 through F6 are upgrade alternatives of existing US 31 from 96th Street to 216th Street, which is a distance of 13.1 miles (Appendix A, Sheets 1 to 13). The existing four-lane roadway would be reconstructed as a six-lane freeway with a 55 foot median (dimension includes inside shoulders), 10 new interchanges, and full access control (Figure 3.2-2).

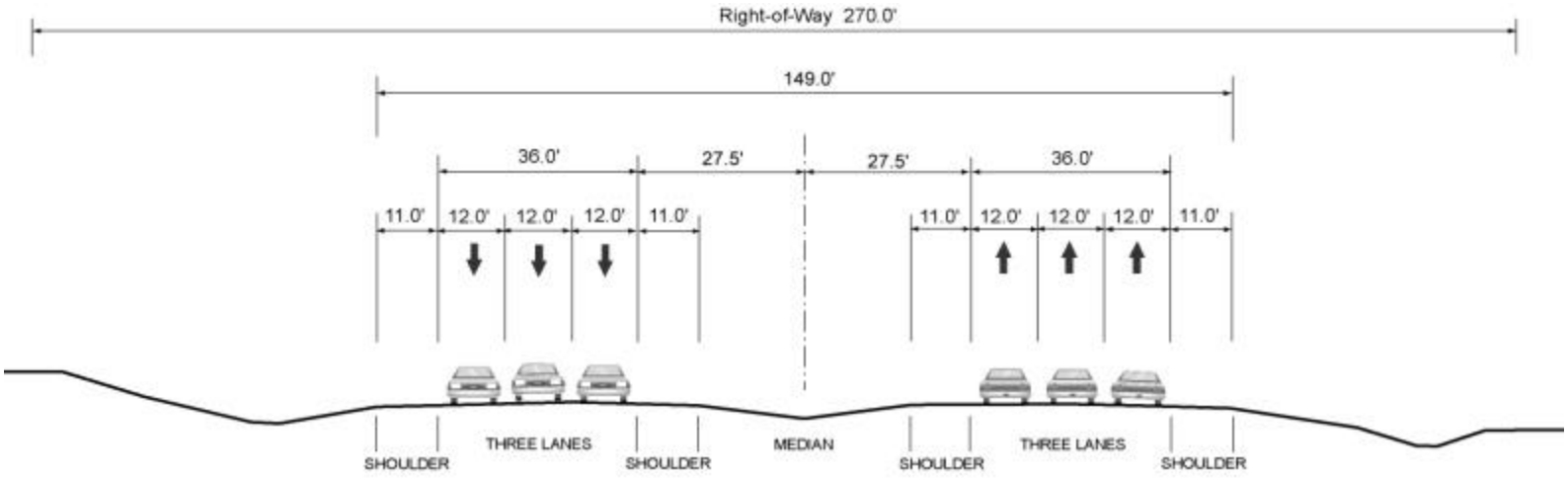
The proposed facility would require existing intersections and access points to be converted to interchanges, overpasses, or access closures. The following road closures, some of which may have cul-de-sacs, would be:

- 103rd Street
- 111th Street
- Old Meridian Street
- Circle Drive
- Rangeline Road (F3 and F6)
- Greyhound Pass
- Westfield Boulevard
- 156th Street
- Buena Vista
- Park Street
- 169th Street
- North Glen Drive
- David Brown Drive
- Blackburn Avenue
- Union Street
- 196th Street
- 202nd Street
- 203rd Street

Below is a description of major elements within Alternatives F1 through F6. Descriptions specific to one or more alternatives are noted. All interchanges are conceptual and subject to change. The interchange footprints could accommodate other configurations, should changes be made later in the design process. If the designed configuration results in a substantial increase in impacts, FHWA and INDOT will conduct a re-evaluation of this EIS or a portion thereof.

- The interchange at I-465 (Appendix A, Sheet 1) would be reconstructed with two semi-directional ramps and two collector-distributor (C-D) ramp systems. The intersection at 96th Street would be improved to the extent necessary to be compatible with the future I-465 interchange, and represents the southern termini of the project.
- The interchange at 106th Street (Appendix A, Sheet 2) would be a Tight Diamond Urban Interchange that is integrated with the I-465 interchange via braided collector-distributor ramps in the southeast (SE) and southwest (SW) quadrants. US 31 crosses over 106th Street.
- The interchange at 116th Street (Appendix A, Sheet 3) would be a Tight Diamond Urban Interchange. A dual-lane northbound exit ramp facilitates the large traffic volumes at this interchange. US 31 crosses over 116th Street.
- Alternatives F1, F2, and F3: A Tight Diamond Urban Interchange is located at 126th Street (Appendix A, Sheet 4A). The alignment shifts to the east approximately 80 feet, creating a new centerline that positions westerly side slopes just adjacent to the property lines in the northwest (NW) quadrants. US 31 crosses over 126th Street and under 131st Street.
- Alternatives F3, F4, and F5: US 31 crosses over 126th Street and under 131st Street. A Tight Diamond Urban Interchange would be located at 131st Street (Appendix A, Sheet 4B).

Figure 3.2-2
Proposed Typical Section
F and G Alternatives



- The interchange at 136th Street (Smokey Row Road) (Appendix A, Sheet 5) would be a Tight Diamond Urban Interchange, with the crossroad realigned to the south to provide space for exit and entrance ramps. 136th Street to the east would be realigned to more directly connect to Old Meridian Street. Rohrer Road in the NW quadrant would be realigned to create a new intersection away from the ramp on the west side of the interchange. The local street, Eglin Drive, would maintain access to 136th Street on the west side of the interchange. US 31 crosses over 136th Street.
- Rangeline Road would cross under US 31 except for Alternatives F3 and F6 (Folded Diamond Interchange Option at 146th Street). For these alternatives, Rangeline Road would be closed at US 31.
- There are three interchange options at 146th Street: A Tight Diamond Urban Interchange (F1 and F4), Lateral Access Interchange (F2 and F5), and a Folded Diamond (F3 and F6). The following attributes are noted for each interchange option:
    - *The Tight Diamond Urban Interchange* option (Appendix A, Sheet 6A) provides direct access to and from 146th Street via ramps in all four quadrants. The current 146th Street bridge and Mechanically Stabilized Earth (MSE) walls would require widening to accommodate four additional turn lanes. Rangeline Road is assumed to extend northward to form a new intersection at 146th Street.
    - *The Lateral Access Interchange* option (Appendix A, Sheet 6B), as initially proposed in the 1997 MIS study, provides indirect access to and from 146th street via Greyhound Pass on the east side and newly created (extended) Rangeline Road on the west side.
    - *The Folded Diamond Interchange* option (Appendix A, Sheet 6C) provides direct access to 146th Street via loop ramps in the SW quadrant and indirect access via lateral ramps to Greyhound Pass in the SE quadrant. Northbound and southbound mainline US 31 is split at the interchange to provide shorter grade separations for SR 431 ramps (identical to current configuration).
    - All interchange options incorporate exit and entrance ramps to SR 431. Note: the exit ramp from NB SR 431 (free flowing into Greyhound Pass), is functionally incorporated into all options.
    - All interchange options provide connection enhancements between 146th Street and 151st Street, through upgrades of existing roads and new road construction (primarily Greyhound Pass and Western Way).
    - All interchange options call for an overpass at 151st Street, which would cross over mainline US 31. No overpass is proposed for Greyhound Pass.
    - All interchange options call for the removal of a crest vertical curve on US 31 mainline between Greyhound Pass and 151st Street to form a partially depressed section having retaining walls for the purpose of minimizing crossroad reconstruction requirements.
    - All interchange options eliminate direct access to US 31 from Greyhound Pass. The existing traffic demand at the US 31 and Greyhound Pass intersection would be shifted to 146th Street with the construction of a 146th Street interchange on US 31.
- The interchange at 161st Street (Appendix A, Sheet 7) is proposed to be a Tight Diamond Urban Interchange, and 161st Street crosses over US 31. To create an acceptable grade, 161st Street would require grade modifications to Westfield Blvd. Access modifications

to the subdivision in the SW quadrant would be necessary (realignment and restricted left turns).

- The interchange at SR 32 (Appendix A, Sheet 9) is proposed to be a Diamond Interchange, and SR 32 crosses over US 31. Realignment of Westfield Park Road away from the ramp intersections would be required. US 31 would be shifted approximately 125 feet to the west to avoid sports and recreational facilities associated with Westfield-Washington Schools (i.e., Section 4(f) resources).
- US 31 would cross under 181st Street.
- The interchange at 191st Street (Appendix A, Sheet 11) is proposed to be a Tight Diamond Urban Interchange, with US 31 crossing over 191st Street. US 31 is shifted to the east 55 feet to avoid a potentially eligible historic property in the SW quad of 191st Street.
- The interchange at SR 38 (Appendix A, Sheet 13) is a Partially Folded Diamond Interchange, with the NB US 31 entrance ramp located in the SE quadrant as a loop ramp. Mainline US 31 would be shifted to the west 50 feet to avoid the future MacGregor Park (Section 4(f) resource) planned in the NE quadrant.
- The proposed US 31 mainline matches existing at approximately 216th Street, which represents the northern termini of the project.

3.2.3 Alternative G1 through G6

Alternatives G1 through G6 follow the same alignment as Alternatives F1 through F6 until 156th Street, where the proposed alignment departs existing US 31 and turns to the east to form a bypass around the Town of Westfield. Alternatives G1 through G6 would consist of a six-lane freeway, 55 foot depressed median (dimension includes inside shoulder), 10 new interchanges, and full access control (see Figure 3.2-2 for a Typical Section). Alternatives G1 through G6 have a total length of 14.1 miles, 7.0 miles of which is off-alignment.

Note: Alternative designations (G1-G6) are identical to Alternative F. Therefore, Alternative G1 is the same as F1; G4 is the same as F4, etc. for all elements south of 156th Street. Below is described those elements unique to Alternatives G1-G6 north of 156th Street (Appendix A, Sheets 1 to 6, and Sheets 14 to 20). All interchanges are conceptual and subject to change. The interchange footprints could accommodate other configurations, should changes be made later in the design process.

- The interchange at 161st Street (Appendix A, Sheet 14) is proposed to be a Modified Diamond Interchange. A directional ramp would exit proposed US 31 northbound and provide access to existing US 31 northbound.

- US 31 would cross under Carey Road.

- The interchange at SR 32 (Appendix A, Sheet 16) is proposed to be a Diamond Interchange, 1.6 miles east of old US 31, and SR 32 would cross over US 31.

- The interchange at 191st Street (Appendix A, Sheet 17-18) is proposed to be a Diamond Interchange, and US 31 would cross over 191st Street. An overpass and re-alignment of Grassy Branch would be incorporated into the interchange configuration.

- The interchange at SR 38 (Appendix A, Sheet 19-20) is proposed to be a Modified Diamond Interchange. The proposed US 31 northbound exit ramp to SR 38 diverges from the northbound roadway approximately one mile south of SR 38. Additionally, access is provided from the proposed US 31 southbound roadway to the existing US 31 southbound and from existing US 31 northbound to the proposed southbound US 31 in this vicinity.

- Existing US 31 would likely be transferred to local jurisdiction (approximately 5.0 miles of roadway).

Below are listed road closures, some of which may have cul-de-sacs, for Alternatives G1 through G6.

- 103rd Street
- 111th Street
- Old Meridian Street
- Circle Drive
- Rangeline Road (G3 and G6)
- Greyhound Pass
- 156th Street
- Westfield Boulevard
- Oak Road
- 196th Street
- 203rd Street
- 216th Street

3.3 Partially Depressed Freeway Evaluation

Over concerns that the US 31 Improvement Project would have detrimental visual and aesthetic impacts to their community, the City of Carmel has requested that a partially depressed freeway be considered for investigation. These concerns were presented in two Carmel/Clay US 31 documents: *Interim Report of Environmental Impact Issues, INDOT US 31 Improvement Project*, dated September 10, 2001, and *The Case for Context Sensitive Design for the US 31 Improvement Project through Hamilton County*, dated Winter 2002.

A geotechnical and hydraulic engineering study of a partially depressed freeway was conducted by INDOT for the DEIS. This section describes why the partially depressed freeway was dismissed and summarizes the key issues in the evaluation.

General Description of Partially Depressed Freeway
A partially depressed freeway evaluation was completed between 106th Street and 131st Street. The tight diamond urban interchanges at 106th Street, 116th Street, and the interchange area between 126th and 131st Street would be partially depressed by 12 feet. Meanwhile, the crossroads would be elevated 12 feet, thus yielding a total of 24 feet between profile grades (crossroad over mainline). Ramps would rise to meet the crossroad grade, and the mainline roadway between interchanges would be at-grade.

Soil borings were taken along US 31 from one-quarter mile north of I-465 to one-half mile north of SR 32 to determine groundwater levels and soil composition. Subsurface soils were found primarily to consist of loam, sandy loam, sand, silty clay loam, and silty clay. Stabilized groundwater levels, also known as the top of zone of saturation, were found to be very shallow, ranging from 3.0 to 10.8 feet (96 hours following the drilling). The depth to groundwater from

the surface was greatest in the US 31 segment from 146th Street to 151st Street, averaging 9.6 feet. Groundwater levels varied from 3.4 to 6.7 feet between 103rd Street and 131st Street, averaging 4.7 feet.

Based on the soil borings and drainage topography the following system was developed. A continuous buried box culvert would convey storm water from 131st Street south to a tributary of Williams Creek just north of 106th Street. A 9x5 (9 feet wide by 5 feet tall) box culvert would be used from 131st Street to 116th Street, followed by a 12x8 foot box culvert to the tributary at 106th Street. This culvert would be located on the west side of US 31. Transverse pipes would drain the east side of the roadway to the culvert on the west side.

The 12x8 foot culvert would discharge into the tributary just north of 106th Street, which flows 2,200 feet to the west until meeting with Williams Creek. Due to the high flows and velocities at the outlet (400 cfs), 1,000 feet of riprap or stone gabions would be required in the initial section of the channel. Additionally, the channel would need to be widened and deepened. However, farther downstream (starting south of 106th Street) the discharge would be allowed to spread throughout the tributary's wider floodplain cross section and dissipate naturally. This may negate the need for a detention pond to regulate flow and filter the highway runoff.

In order to use this tributary, the grades of 106th Street and Spring Mill Road would require approximately 5 feet of grade raise. Additionally, a new culvert structure would be required at 106th Street and a new bridge structure at Spring Mill Road (where the tributary crosses).

The culvert trunkline described above would drain the freeway from 131st Street until approximately 900 feet north of 106th Street to form a continuous drainage run. It uses gravity flow throughout. However, the 106th Street depressed interchange is the lowest section of the entire project and would be part of a separate drainage area. This area would require surface water runoff to be pumped via a nearby pump station. The discharge from this area was estimated at 55 cfs, and would be conveyed 1000 feet to the same tributary mentioned above via a 42" pipe.

Design Issues and Concerns

Pump stations would be required at 106th Street for surface drainage. Pump stations add expense to the project, have high life-cycle costs, and present a risk to the long-term integrity of roadway pavement. They would require continual maintenance and inspection. Pump functionality is critical not only to the long-term integrity of road elements but also to usage of the highway facility, particularly during rainfall periods. Pump failure may result in closure of a crucial highway link and result in major delays for thousands of travelers. This would represent a significant increase in risk when compared to a surface drainage design for a facility that is not depressed. As a result, all pump systems, both mechanical and electrical, would need to have backup systems, such as natural gas powered generators and additional pumps. This redundancy would greatly reduce the possibility of closures and delays associated with equipment failure.

Groundwater is a concern for proper performance and durability of a highway pavement, stability of side slopes and retaining walls, and construction excavation. As shown by soil borings done specifically for this investigation, groundwater is high throughout the evaluated

area, and is highest in the US 31 segment from 103rd Street to 131st Street. Active measures of controlling the groundwater (dewatering), such as pumps and wells, would be required. The new groundwater profile would need to be lowered below the roadway subgrade. Pumped groundwater would be drained to the aforementioned trunkline culverts. Two groundwater pumps would be used at each of the three depressed interchange areas for a total of six groundwater pumps. These mechanical devices represent an additional cost and would require maintenance and inspection for the life of the facility.

Traffic maintenance during construction for a partially depressed freeway would be more complex than a standard freeway. The construction of each partially depressed interchange would need to occur in two major phases, with half of the interchange being constructed at a time. Sheet piling or other means of soil retention would be required to separate these construction phases. The crossroads would need to be closed to cross traffic, and local detours would be necessary.

The depressed freeway would cost more to construct and maintain, introduce risk to the long-term integrity of pavement and roadside elements, and introduce several complications. As mentioned above, sheet piling would be required to separate the two phases of construction. Dewatering of the excavated area would be required during the construction period. It may be necessary to construct the entire culvert trunkline initially to provide an outlet for construction drainage. Given the maintenance of traffic complications, construction of multiple interchanges in a season would need to be carefully sequenced.

Aesthetic benefits are considered by the local municipalities to be one of the main advantages for using a depressed freeway. For a partially depressed mainline with a cross road-over configuration, the ramps would rise from the mainline to meet the partially elevated crossroad. These ramps would be approximately 10 feet above the existing cross road, and because of this, the ramps would result in visual impacts. These ramps, while smaller in height than a fully elevated mainline (approximately 25 feet above existing US 31), would shift visual impacts closer to the adjacent properties in the corridor.

Earthwork for a partially depressed interchange would be nearly balanced. There would be an estimated 8.7% more cut than fill (cut: 134,000 cyds, fill: 116,000 cyds). While the earthwork is roughly balanced, the cut soil would be saturated. Its use as a fill material would require drying and soil stabilization before placement and compaction, thus adding construction time and expense to each interchange.

Environmental Issues and Concerns

The tributary being used to convey discharged highway water would require channel relocation, widening, deepening, and riprap for approximately 1000 feet. Natural resources would be impacted in this area. IDEM and the USACE may require permitting and mitigation for impacts at a 1:1 ratio (typical).

Additional right-of-way (approximately 4 acres) would be required for placement of the trunkline culvert riprap bedding in the Williams Creek tributary. A drainage easement would likely be necessary within this tributary. No additional R/W would be required for the partially

depressed interchange when compared to a conventional diamond interchange in a mainline over configuration.

Nearby private wells may be affected by the pumping of groundwater at each interchange. As well, nearby wetlands may be impacted due to hydrologic draw-down from nearby groundwater pumps. If impacted, this would require permitting from regulatory agencies, mitigation ratios ranging between 2:1 to 4:1, and 3 to 5 years of monitoring of the mitigation sites. Detention ponds should not, however, be impacted by groundwater pumping. Most detention ponds are constructed with either earthen or synthetic liners, creating a perched reservoir.

Overall noise levels through the corridor would not be appreciably improved. This is due to the localized nature of the partial depression that would be at interchanges only (areas between interchanges are still at grade), and the depth to which the roadway would be depressed, in this case 12 feet. Furthermore, there are few noise receptors in the area considered for a depressed freeway.

Differential settlement due to subsidence from groundwater draw-down may be a problem for nearby office buildings. This would depend on the depth of the foundations, soil type, and behavior. Buildings with deep foundations that extend well below the groundwater table would likely experience no settlement. However, shallow foundations would be more susceptive to settlement.

Summary and Cost Estimate

This evaluation considered a partially depressed freeway from 106th Street to 131st Street. Approximately 9800 feet of box culvert would be required for surface and groundwater drainage. A pump station would be required at 106th Street for conveyance of stormwater and surface runoff. Groundwater pumps would be located at each of the three depressed areas. Environmental mitigation measures for wetlands and the Williams Creek tributary would be required. Local road improvements would be required on 106th Street and Spring Mill Road. Construction costs and traffic control for each affected interchange would be higher. Taken together, these items are estimated to increase the base construction cost of the project by approximately 17-23 million dollars. In addition, the need to remove surface runoff and groundwater by electrical and mechanical means places the highway at risk of physical damage and loss of transportation service in the event of equipment failures.

Recommendation

The main justification from local municipalities behind using a depressed freeway is for visual considerations along the corridor. There are no engineering, hydraulic, or geotechnical constraints, opportunities, or objectives that compel the design of a depressed freeway. (Whereas, the US 31 segment from 146th street north to 151st street has conditions suitable for a partial depression of the mainline). Moreover, there are no environmental or right-of-way issues which require a depressed freeway. As a result of the increased costs, risks, environmental impacts, and traffic maintenance concerns, a partially depressed freeway was not considered a reasonable option for reducing potential visual and aesthetic impacts and was therefore eliminated from further consideration.

3.4 Identification of a Preferred Alternative

Based on the following findings, Alternatives F1 through F6 have been identified as the preferred group of alternatives (Figure 3.2-1). Following the DEIS public comment period and the public hearing, a single alternative would be selected and presented in the Final Environmental Impact Statement (FEIS).

Natural Resource Impacts
South of 156th Street, Alternatives F1 through F6 (or F Alternatives) are the same as Alternatives G1 through G6 (or G Alternatives) and, therefore, would result in the same impacts. However, north of 156th Street, the G Alternatives travel off-alignment while the F Alternatives utilized the existing US 31 alignment and right-of-way. As a result, the G Alternatives would have greater overall impacts to natural resources such as wetlands, streams, forestland, floodplains/floodways, wildlife, and wildlife habitat than the F Alternatives (Table 5.1-1).

The most notable impacts from the G Alternatives are associated with Cool Creek between 156th Street and Oak Road (Appendix A, Sheets 14 and 15). At this location, the G Alternatives would result in a longitudinal encroachment (>1 mile) and crossing of Cool Creek that would impact approximately seven more acres of floodways and five more acres of floodplains than the F Alternatives (Appendix A, Sheet 7). In addition, the G Alternatives would impact seven more forested wetlands than the F Alternatives with a total of nearly 5 acres of impacts (Table 5.12-1). The majority of the forested wetland impacts (4.6 acres) occur along the floodplains of Cool Creek within the largest wetland (9.7 acres) in the project area. The value of this wetland is considered high for the following functions: flood storage; wildlife habitat; sediment/toxicant retention; and nutrient removal. Both the US Fish and Wildlife Service (USFWS) and the Indiana Department of Natural Resources (IDNR) have identified the forested floodplain of Cool Creek located east of US 31 and north of 156th Street as an important habitat that should be avoided (Appendix C, Pages 11, 29, 33, 34, 48, 49 and 50). The F Alternatives would avoid nearly this entire sensitive habitat.

Because the F Alternatives utilized the existing alignment, the stream impacts are limited primarily to the widening of culverts at existing stream crossings. The G Alternatives, however, would result in seven new stream crossings, including two separate crossings of Cool Creek, involving either bridges or culverts. Overall, the G Alternatives would result in five more stream crossings and approximately 2,000 more linear feet of stream impacts than the F Alternatives.

The G Alternatives would impact 45 to 60 more acres of forestland than the F Alternatives. The IDNR has identified two upland hardwood forest sites that would be impacted by the G Alternatives as providing important wildlife habitat, particularly for migratory songbirds (Appendix C, Pages 51).

With regard to the overall impacts to natural resources, IDNR has stated that the F Alternatives would "disturb the fewest fish and wildlife habitat areas" and, therefore, the impacts would be "minimal and reasonable" (Appendix C, Page 51).

Agricultural Land/Prime Farmland Soils Impacts

The G Alternatives would impact approximately 175 more acres of active agricultural land and 180 more acres of prime farmland soils than the F Alternatives. The G Alternatives would also bisect a number of agricultural parcels along the east side of the Town of Westfield. Two large parcels are located south of SR 32 and sixteen parcels are located north of SR 32. Four of these bisected parcels would be "land-locked" and require access provisions or land acquisition. The remaining parcels would require the existing landowners to travel longer distances and to traverse local public roads with their equipment. The F Alternatives use the existing US 31 alignment and, therefore, would not bisect any agricultural land.

Purpose and Need

Although both the F Alternatives and G Alternatives meet the project's purpose and need, the F Alternatives would better satisfy the project's purpose for improving the level of safety along the US 31 corridor because they would result in the upgrading of the entire existing US 31 alignment to freeway design standards, which have lower crash rates. With the G Alternatives, the remaining section of US 31 (approximately 5 miles) would still be an expressway with at-grade signalized intersections, a number of unsignalized intersections, and direct access from several residential and commercial driveways. This section, therefore, would generally have higher crash rates than a freeway system. As a result, the G Alternatives would have less of an overall improvement to safety than the F Alternatives. The No-Action Alternative would not meet the project's purpose and need.

Other Considerations

Community Opinion:

During the Preliminary Alternatives Analysis and Screening phase of the project, Alternative G was presented as an alternative to be carried forward for detailed study in the DEIS at Public Meeting #2 held on July 30, 2002. Approximately 30 citizens spoke at this meeting and nearly all of these individuals were opposed to Alternative G. Following the meeting, approximately 90 comment forms, emails, and phone calls were received from citizens voicing opposition to Alternative G. Additionally, letters stating opposition to Alternative G were received from the Town Council of Westfield, the Westfield-Washington Chamber of Commerce and the Westfield-Washington School Corporation Board. In addition, a letter signed by representatives of 10 neighborhood associations in Washington Township (comprised of 905 homes) was received, also in opposition to Alternative G. Finally a petition was submitted by the Westfield-Washington Alliance of Neighborhood Associations with more than 400 names favoring Alternative F.

Proposed Development/Compatibility with Local Land Use Plans:

The F and G Alternatives are the same south of 156th Street and, therefore, would have the same impacts to proposed developments through this area. North of 156th Street, the F Alternatives remain on the existing US 31 alignment and, as such, are more compatible with the Town of Westfield and Washington Townships 2020 Comprehensive Plan, which also include their thoroughfare plans. The only impacts to proposed developments from the F Alternatives north of 156th Street are associated with the parking lots and access for Cool Creek Commons, a proposed 23-acre commercial development (Appendix A, Sheet 7). This development is in the planning process and has not been platted.

The G Alternatives north of 156th Street would impact nearly all of the proposed Cool Creek Commons commercial development (Appendix A, Sheet 14). The G Alternatives would also bisect the proposed Oak Manor Planned Unit Development (PUD), a large mixed-use development with over 300 residential lots, 150 apartments, and a 23-acre commercial center (Appendix A, Sheet 15 and 16). This development is in the planning process and has not been platted. Because the G Alternatives represent an eastern bypass of the Town of Westfield, they would not be compatible with their comprehensive and thoroughfare plans. Most of the area along the G Alternatives is currently active agricultural land but is planned for residential development. The G Alternatives may shift the demand for development through this area from residential to commercial.

Overall, the G Alternatives would impact from between 76 to 105 acres more of proposed development than the F Alternatives.

Construction & Maintenance Costs:
The overall costs associated with the G Alternatives would be greater than those with the F Alternatives. Though the right-of-way costs are higher for the F Alternatives, the construction costs of the G Alternatives contribute to make the total cost approximately $4 million to $21 million higher than the F Alternatives. In general, the G Alternatives would have greater construction and maintenance costs because they are on a new alignment and approximately one mile longer than the F Alternatives. This added distance along with the remaining US 31 facility also results in more vehicle miles traveled for the G Alternatives and a seven percent increase in the annual operational energy consumed when compared with the F Alternatives.

In addition, approximately five miles of the existing US 31 facility would remain along the west side of the Town of Westfield with the G Alternatives. Maintenance of this remaining facility would be required in addition to the new alignment. According to the INDOT Greenfield District, roadway maintenance of this five-mile section of US 31 would cost approximately $100,000 per year. This estimate is based on a four-year average (1999 to 2003) of costs incurred on US 31 through this location.

Residential/Commercial Displacements:
The only notable impacts that would be greater for the F Alternatives are the number of residential and commercial displacements. The F Alternatives would result in 16 to 22 more residential displacements and 28 to 30 more commercial displacements when compared with the G Alternatives. Most of the commercial displacements occur at the SR 32 interchange while most of the residential displacements occur at the 161st Street and 191st Street interchanges and at the North Glenn Village mobile home community.